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December 11, 2001

BOX PCT

Commissioner for Patents
Washington, D.C. 20231

Express Mail No. EF279045939US
PCT/US00/15990
-filed June 9, 2000

Re: Application of Gerald BURNETT, Jozef C. LAUWERS, Lauren CALABY, James HUGHES, Yul INN, Richard VANDERLIPPE, Eric HORSCHMAN, Brian WALLIN, Lester LUDWIG
SYSTEM AND METHOD FOR BROWSER BASED MULTIMEDIA COLLABORATION REPORTING
Assignee: COLLABORATION PROPERTIES, INC.
Our Ref: CA1149

Dear Sir:

The following documents and fees are submitted herewith in connection with the above application for the purpose of entering the National stage under 35 U.S.C. § 371 and in accordance with Chapter II of the Patent Cooperation Treaty:

- ☐ an executed Declaration and Power of Attorney.
- ☐ an English translation of the International Application.
- ☑ 47 sheet(s) of drawings.
- ☐ an English translation of Article 19 claim amendments.
- ☐ an English translation of Article 34 amendments (annexes to the IPER).
- ☐ an executed Assignment and PTO 1595 form.
- ☑ a Form PTO-1449 listing the ISR references, and a complete copy of each reference.
- ☑ a Preliminary Amendment

The Declaration and Power of Attorney and Assignment will be submitted at a later date.

It is assumed that copies of the International Application, the International Search Report, the International Preliminary Examination Report, and any Articles 19 and 34 amendments as required by § 371(c) will be supplied directly by the International Bureau, but if further copies are needed, the undersigned can easily provide them upon request.

Applicant claims benefit of small entity status in accordance with 37 CFR § 1.27.

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The Government filing fee is calculated as follows **(Small Entity fees apply)**:

Total claims	52	-	20	=	32	x	$9.00	= $288.00
Independent claims	6	-	3	=	3	x	$42.00	= $126.00
Base Fee								$50.00
TOTAL FEE								$464.00

A check for the statutory filing fee of $464.00 is attached. You are also directed and authorized to charge or credit any difference or overpayment to Deposit Account No. 19-4880. The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16, 1.17 and 1.492 which may be required during the entire pendency of the application to Deposit Account No. 19-4880. A duplicate copy of this transmittal letter is attached.

Priority is claimed from:

Country	Application No	Filing Date
U.S. Provisional	60/138,921	June 11, 1999

Respectfully submitted,

Frank L. Bernstein
Registration No. 31,484

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Date: December 11, 2001

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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Express Mail No. EF279045939US

Gerald BURNETT et al.

Filed: Concurrently herewith

For: SYSTEM AND METHOD FOR BROWSER-BASED MULTIMEDIA COLLABORATION REPORTING

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination, please amend the above-identified application as follows:

IN THE SPECIFICATION:

Amend the specification by inserting before the first line the sentence:

This is a National stage entry under 35 U.S.C. § 371 of Application No. PCT/US00/15990 filed June 9, 2000, which claims benefit of Provisional Application No. 60/138,921 filed June 11, 1999; the above noted prior applications are hereby incorporated by reference.

IN THE ABSTRACT:

Please insert the following Abstract of the Disclosure.

A multimedia collaboration reporting system and method for use in at least one underlying multimedia collaboration system network is provided. The system includes an event monitoring module for monitoring any of internal network system events, external network system events and service events, a database module for recording the monitored events and a

reporting module for receiving query parameter information and for generating a report in accordance with the query parameter information. The method includes monitoring any of internal network system events, external network system events and service events and recording the events to a database, querying the database with a set of query parameter information to generate an analysis report and generating the analysis report in accordance with the query parameter information.

Express Mail Label No. EV 339 908 425 US

REMARKS

Entry and consideration of this Preliminary Amendment is respectfully requested.

Respectfully submitted,

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Date: December 11, 2001

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PRELIMINARY AMENDMENT

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The following paragraph was added before the first line of the specification:

This is a National stage entry under 35 U.S.C. § 371 of Application No. PCT/US00/15990 filed June 9, 2000, which claims benefit of Provisional Application No. 60/138,921 filed June 11, 1999; the above noted prior applications are all hereby incorporated by reference.

IN THE ABSTRACT OF DISCLOSURE:

The abstract has been added.

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SYSTEM AND METHOD FOR BROWSER-BASED MULTIMEDIA COLLABORATION REPORTING

The present invention relates to multimedia collaboration systems, and in particular to a multimedia collaboration event and status reporting system.

BACKGROUND OF THE INVENTION

Multimedia collaboration systems facilitate the exchange of audio, video, text, graphics, application commands and/or other types of information between users in real, near-real, or non-real time communication. Interpersonal communication involves a large number of subtle and complex visual cues, such as eye contact and body language, which provide additional information beyond spoken words and explicit gestures. These cues are, for the most part, processed subconsciously by the participants and often control the course of a conversation. Multimedia collaboration systems advantageously allow users to detect these cues and thereby enhance the communication between users.

In addition to spoken words, demonstrative gestures and behavioral cues, collaboration often involves the sharing of visual information, such as printed material (i.e., articles), drawings, photographs, charts and graphs, as well as videotapes and computer-based animations, visualizations and other displays, in such a way that participants can collectively and interactively examine, discuss, annotate and revise the information. This combination of spoken words, gestures, visual cues and interactive data sharing significantly enhances the effectiveness of collaboration in a variety of contexts, such as "brainstorming" sessions among professionals in a particular field, consultations between one or more experts and one or more clients, sensitive business or political negotiations, and the like. In a traditional collaboration system, such as one in which the participants cannot be in the same place at the same time, the beneficial effects of face-to-face collaboration are realized only to the extent that each of the remotely located participants can be "recreated" at each site.

Conventional desktop videoconferencing systems do not address the challenges of collaboration in real-time, primarily because of their lack of high-quality video (for capturing the visual cues of the participants) and their limited data sharing capabilities. Similarly, telephone answering machines, voice mail, fax machines and conventional electronic mail

systems provide incomplete solutions to the problems presented by asynchronous collaboration because they are incapable of communicating visual cues, gestures, etc., and like conventional video conferencing systems, are generally limited in the richness of the data that can be exchanged.

Moreover, the suggestion of extending traditional videoconferencing capabilities from conference centers, where groups of participants are assembled in the same room, to the desktop, where individual participants may remain in their office or home, does not facilitate the interactive sharing of data in the form of text, images, charts, graphs, recorded video, screen displays and the like. Such systems attempt to add computing capabilities to a videoconferencing system, rather than adding multimedia and collaborative capabilities to the user's existing computer system. The same disadvantages apply to augmented video conferencing systems with limited "video mail" capabilities. While useful in limited contexts, these systems do not provide the capabilities for maximally effective collaboration.

Conversely, audio and video capture and processing capabilities have been integrated into desktop and portable personal computers and workstations. These capabilities have been used primarily in desktop multimedia authoring systems for producing CD-ROM and DVD-ROM based works. While such systems are capable of processing, combining and recording audio, video and data locally, i.e. at the desktop, they do not adequately support networked collaborative environments, principally due to the substantial bandwidth requirements for real-time transmission of high-quality, digitized audio and full-motion video which preclude conventional local area networks (LANs) from supporting more than a few workstations or personal computers. These systems do not adequately address the problems inherent in a practical implementation of a scalable collaboration system.

Examples of high-quality video multimedia collaboration systems are described in U.S. Patent No. 5,617,539 and Patent Cooperation Treaty Application Numbers PCT/US99/01789 and PCT/US98/23596. As the use of these video-oriented multimedia collaboration systems becomes more common, and as multimedia collaboration systems support ever-greater numbers of users, users and/or system administrators will require system usage, diagnostic, performance, and cost monitoring capabilities. Such capabilities may include, for example, the ability to determine the source of system errors, the generation of statistics detailing manners

in which particular system resources are utilized and the generation of usage statistics for one or more users relative to a given time period. To date, however, multimedia collaboration systems have provided limited and generally inflexible system monitoring and reporting capabilities. A system is needed that provides an expansive and flexible monitoring and reporting capability to facilitate the management of multimedia collaboration systems. It is to this end that the present invention is directed.

1.

SUMMARY OF THE INVENTION

The present invention provides a scalable, evolvable, flexible, and architecturally accommodating system and method for a wide range of potential reporting functions of value in multimedia collaboration systems or other complex networked systems. The system and method herein are particularly advantageous in that they can be applied to a wide variety of systems of arbitrary levels of scale and decentralization and provide a wide range of information on usage, operations, costs, and failures in a wide variety of standard or custom report or query formats servicing the wide ranging needs of usage monitoring, planning, billing and accounting, maintenance, diagnostics, reconfiguration study and design.

In an aspect of the invention, a multimedia collaboration reporting system for use in at least one underlying multimedia collaboration system network is provided. The system includes an event monitoring module for monitoring any of internal network system events, external network system events and service events, a database module for recording the monitored events and a reporting module for receiving query parameter information and for generating a report in accordance with the query parameter information.

The system architecture is such that any of the event monitoring module, the database module and the reporting module may be centralized to the underlying multimedia collaboration system network. Alternatively, any of the event monitoring module, the database module and the reporting module are decentralized from the underlying multimedia collaboration system network. In such case, the decentralization of any of the modules may result in a system architecture that reflects an architecture of the underlying multimedia collaboration system network.

Advantageously, the database may comprise a plurality of localized databases, each configured to store monitored event information from a predetermined multimedia collaboration system network and a centralized database configured to centrally maintain the stored information from each of the plurality of localized databases. Alternatively, the database may comprise only a centrally located database configured to maintain the monitored event information.

The reporting module is configured to generate either standard or customizable reports about the multimedia collaboration system network in response to database query parameter information and may include a web-based interface providing for web-based query and response interactivity such that a database query can be formulated and provided via the Internet.

In another aspect of the invention, a multimedia collaboration system for conducting a conference among a plurality of participants is provided. The system includes a multimedia collaboration system network having a plurality of workstations each having a monitor for displaying visual images and A/V capture and reproduction capabilities for capturing and reproducing video images and spoken audio of the participants, a data network providing a data path along which data can be shared among the plurality of the workstations a data conference manager for managing the sharing of data between the plurality of workstations. Additionally, the system includes an independent reporting system connected with the multimedia collaboration system network and configured to provide reporting analysis of the multimedia collaboration system network. The independent reporting system includes a network control system configured to monitor any of internal, external or service event information affecting the multimedia collaboration system network, a database configured to store the monitored event information, a database query system configured to format a database query according to query parameter information and to query the database in accordance with the database query parameter information and a report generation system configured to generate an analysis report from the monitored event information stored in the database in accordance with the database query parameter information.

In another aspect of the invention, a method for generating reports identifying multimedia collaboration system events includes monitoring any of internal network

system events, external network system events and service events and recording the events to a database, querying the database with a set of query parameter information to generate an analysis report and generating the analysis report in accordance with the query parameter information.

In still another aspect of the invention, a reporting system is provided including a network control system configured to monitor any of internal, external or service event information of a multimedia collaboration system network, a database configured to store the monitored event information, a database query system configured to format a database query according to query parameter information and to query the database in accordance with the database query parameter information and a report generation system configured to generate an analysis report from the monitored event information stored in the database in accordance with the database query parameter information.

(B)

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram of an exemplary multimedia collaboration system;

Fig. 2 is an illustration showing an exemplary networked organization of multimedia collaboration systems;

Fig. 3 illustrates some example general high-level call events that can be captured from within multimedia network environments;

Fig. 4 is a block diagram showing an exemplary implementation for a reporting environment in a multimedia network environment, such as that shown in Fig. 1;

Figs. 5A-C are respective block diagrams illustrating exemplary implementations for handling the inherent decentralization of reporting environments in multimedia network environments in accordance with the invention;

Fig. 6 is a block diagram illustrating an example of the operational interactions between various hardware, software, and database component in accordance with an embodiment of the present invention;

Figs. 7A and 7B are respective exemplary database structures showing record and field definitions for use in event logging in accordance with the invention;

Fig. 8 depicts a general connection environment useful for defining various call types and database fields that are associated with records for such call types;

Figs. 9A1-9C2 illustrate alternatives and evolutions of user interface implementation environments that can be utilized by the reporting system in accordance with the present invention;

Fig. 10 is an example of a user interface for importing database records to the multimedia collaboration system in accordance with the invention;

Fig. 11 is an example of a user interface for deleting database records from the multimedia collaboration system in accordance with the invention;

Fig. 12 is an example of a menu of report choices selectable by a user for generating standard reports from the multimedia collaboration system in accordance with the invention;

Fig. 13A is an example of a set-up interface for determining report generation parameters for generating a calls between users report in accordance with the invention;

Fig. 13B depicts an exemplary report of calls among all or specified users in accordance with a set of reporting parameters established in the set-up interface of Fig. 13A according to the invention;

Fig. 14A is an example of a set-up interface for determining report generation parameters for generating a user call detail report in accordance with the invention;

Fig. 14B depicts an exemplary report of user calls in accordance with a set of reporting parameters established in the set-up interface of Fig. 14A according to the invention;

Fig. 15A is an example of a set-up interface for determining report generation parameters for generating a number of calls completed by user report in accordance with the invention;

Fig. 15B depicts an exemplary report of the number of calls completed by a user in accordance with a set of reporting parameters established in the set-up interface of Fig. 15A according to the invention;

Fig. 16A is an example of a set-up interface for determining report generation parameters for generating a number of calls completed by time period report in accordance with the invention;

Fig. 16B depicts an exemplary report of the number of calls completed by time period in accordance with a set of reporting parameters established in the set-up interface of Fig. 16A according to the invention;

Fig. 17A is an example of a set-up interface for determining report generation parameters for generating a call duration report in accordance with the invention;

Figs. 17B-17D depict respective exemplary reports of call duration in accordance with a set of reporting parameters established in the set-up interface of Fig. 17A according to the invention;

Fig. 18A is an example of a user call total by time period report in accordance with a set of established reporting parameters according to the invention;

Fig. 18B is an example of a network availability by number of calls report in accordance with a set of established reporting parameters according to the invention;

Fig. 18C is an example of a network availability by percentages of calls report in accordance with a set of established reporting parameters according to the invention;

Fig. 19A is an example of a set-up interface for determining report generation parameters for generating a total device usage by number of calls report in accordance with the invention;

Fig. 19B is an example of a device usage by number of calls report in accordance with a set of reporting parameters established by the set-up interface of Fig. 19A according to the invention;

Fig. 20A is an example of a set-up interface for determining report generation parameters for generating a total device usage by duration report in accordance with the invention;

Fig. 20B depicts an exemplary device usage by duration report in accordance with a set of reporting parameters established by the set-up interface of Fig. 20A according to the invention;

Fig. 21A is an example of a set-up interface for determining report generation parameters for generating a total device usage by time period report in accordance with the invention;

Fig. 21B depicts an exemplary total device usage by time period report in accordance with a set of reporting parameters established by the set-up interface of Fig. 21A according to the invention;

Fig. 22A depicts an exemplary conference center usage by numbers of uses report according to the invention;

Fig. 22B depicts an exemplary conference center usage by cumulative time used report according to the invention;

Fig. 22C depicts an exemplary conference center busy by percentage of attempted uses report according to the invention;

Fig. 22D depicts an exemplary conference call availability report according to the invention;

Fig. 22E depicts an exemplary trunk busy report according to the invention;

Fig. 23 is an example of a menu from which a user may select a variety of user-defined custom reports in accordance with the invention;

Fig. 24 is an example of a custom report interface for saving custom reports in accordance with the invention; and

Fig. 25 is an example of a custom report save notification interface for indicating the success or failure of a saved report request in accordance with the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention provides a scalable, evolvable, flexible, and architecturally accommodating system and method for a wide range of potential reporting functions of value in multimedia collaboration systems or other complex networked systems. The system and method herein are particularly advantageous in that they can be applied to a wide variety of systems of arbitrary levels of scale and decentralization and provide a wide range of information on usage, operations, costs, and failures in a wide variety of standard or custom report or query formats servicing the wide ranging needs of usage monitoring, planning, billing and accounting, maintenance, diagnostics, reconfiguration study and design.

An aspect of the present system and method is to provide a powerful framework for arbitrary degrees of standard and customized report generation and access, including web-based access, for networked systems spanning a wide range of network configurations, architectural variations, evolving technologies, evolving services, and entities attached to the networks.

Fig. 1 is a block diagram illustrating a conventional video-oriented multimedia collaboration system **99** such as is shown and described in U.S. Patent No. 5,617,539, entitled "Multimedia Collaboration System with Separate Data Network and A/V Network Controlled by Information Transmitting on the Data Network," and issued to Ludwig et al., on April 1, 1997, which is incorporated herein by reference. While a video-oriented multimedia collaboration system **99** is shown in Fig. 1, it should be noted that the present invention is applicable to any multimedia collaboration system or other networked system and the above Figure is merely exemplary and is not intended to be limiting.

As shown in Fig. 1, the multimedia collaboration system **99** includes a number of component entities, including a plurality of user workstations **40**, a multimedia local area network (MLAN) **10**, a conference bridge or center **36** (a hardware device for audibly and visually connecting multiple parties to a conference), an A/V storage server **100**, a LAN **20** coupled to a gateway **25** and a first wide area network (WAN) **29**, and an A/V codec **38** coupled to a second WAN **39**. These component entities will be described in more detail herein.

The MLAN **10** comprises an A/V switch **32** and an A/V network manage r (AVNM) **34** or similar managing system or other call/connection control entity whose function will be described in detail herein. The user workstations **40** are connected with the system **99** via the A/V switch **32** resident in the MLAN **10**. The A/V switch **32** also couples the MLAN **10** to the A/V storage server **100**, as well as coupling the second WAN **39** to the MLAN **10** via codec **38** (an integrated circuit for performing data conversion). The first WAN **29** is connected to the LAN **20** via the gateway **25**. The LAN **20** is in communication with the AVNM **34** thereby affording network management to the LAN **20**. The LAN **20** also functions to couple additional enterprise computers **60** and e-mail/voice-mail application functionality **50** to the system entities connected therewith.

The A/V storage server **100** may be coupled to or otherwise in communication with the network, such as via the switch **32**. Such embodiments are described in Patent Cooperation Treaty Application Numbers PCT/US99/01789 and PCT/US98/23596 and are hereby incorporated herein by reference. Briefly, the A/V storage server **100** includes an A/V storage manager **160** for coordinating requests for the storing and playing back of video data and the like, and one or more A/V storage cells **120** configured to store video data and other supplemental information. These cells **120** may be either directly connected to the storage manager **160** (represented as reference numeral **112**) or connected with the storage manager **160** via a data LAN **110** that also serves to couple external systems to the network.

In the conventional system shown in Fig. 1, the A/V switch **32** facilitates selective coupling between user workstations **40**, the LAN **20**, and the codec **38**. The A/V switch **32** may also facilitate direct coupling to one or more other multimedia collaboration systems **99**. Therefore, workstation users can communicate with each other via multimedia conferencing, such as is described in U.S. Patent No. 5,617,539. Other similar network configurations are also possible and provided for by the invention.

In operation, the AVNM **34** generates event or reporting records in response to a variety of system events. Exemplary types of events for which reporting records are generated, and information included in such reporting records, will be described in detail herein. The following exemplary events that are monitored by the system are largely oriented towards internal and external networks, but in general may also apply to connected service entities.

Such events may include server startup and shutdown events. For example, each startup and shutdown record may include startup time, shutdown time, any applicable error code and any associated error string as well as other additional information.

Another event that may be monitored by the system includes user login and logout events. For example, each user login and logout record may include a user ID, a login or logout time as appropriate, and possibly client platform, client type, client operating system version, client collaboration system software version, and other supplemental information. Additionally, aliases are provided for so that a user can associate a different login ID when desired.

Call events may also be monitored by the system. For example, each call record may include a caller or calling party ID, a call session ID, a caller terminal port ID, a caller mode description, a caller codec ID, a caller trunk port number, a callee ID, a callee terminal port ID, a callee mode description, a callee terminal ID, a callee codec ID, a callee trunk port ID, a starting time stamp, and a completion time stamp.

In addition, call error events may be monitored by the system. For example, each call error record may include information detailing call failures for reasons such as trunk unavailability, gateway failures, etc., and typically may include a session and/or call ID and timestamp information.

Another event that may be monitored by the system includes service events. For example, each service record may include details specifying service resources and typically may include a session ID and timestamp information.

Service error events may also be monitored by the system. For example, each service error record may include details specifying service resource problems, operational errors and typically may include a session ID and timestamp information.

In accordance with the invention, call records affiliated with multi-party calls and multi-point broadcasts may be associated through the utilization of a common session ID. Similarly, service records for sessions and events pertaining to services outside the scope of the network

itself, such as video storage services, may also be associated with corresponding calls and call events through the use of a common session ID. For example, in an embodiment of the invention, a session may be defined as a time interval that begins when system or conference center resources are allocated for a new call that is not associated with a call currently in progress. Accordingly, the session is defined to end when the resources that are allocated in association with the call are freed for others to use. It should be noted that the addition of new callers to an existing two-party call to form a multi-party call falls within the context of an already-existing session.

In accordance with the invention, the AVNM **34** creates a new session ID each time resources are allocated for a new call that is not associated with a call currently in progress. For example, in an embodiment of the invention, the AVNM **34** transfers or propagates session IDs to other AVNMs **34** and remote clients **40, 45**. Thus, when a new party is added to an existing call, the AVNM **34** associated with the calling party transfers the existing session ID to the AVNM **34** associated with the callee. The session ID stored within each call record associates multi-step calls and/or calls made on different collaboration systems, such as when a third party is added to a two-party call.

The present invention is equally applicable to a networked environment of multimedia collaboration systems **99**, either provided locally or in a wide-area sense. Fig. 2 is an illustration of an exemplary networked organization **199** of multimedia collaboration systems **99**, such as that shown in Fig. 1. As the scope of such systems expand and as costs are incurred for equipment and telecommunications services, a number of needs emerge for reporting functions that provide information on the usage, operations, costs, and failures of the associated networked organization of multimedia collaboration systems **199** , the individual multimedia collaboration systems **99** and their components. These reporting functions can be utilized for usage monitoring, planning, billing and accounting, maintenance, diagnostics, reconfiguration study and design, as well for other diagnostic and application-specific purposes.

Because of the resulting wide range of potential reports which could prove beneficial, the present invention provides a framework for arbitrary degrees of standard and customized report generation and access. These reports can be generated by gathering information from throughout the network **199** and from the entities connected to it. As such, the reporting

system framework of the invention can accommodate the wide range of network configurations, architectural variations, evolving technologies, evolving services, and entities attached to the networks **199**.

Architecturally, the reporting function of the present invention can be treated as a general form of service supported and provided by a server. In accordance with the invention, an implementation of the reporting server **210** may be centralized or decentralized and take on a variety of forms that will be explained in detail herein. For example, a report server **210** working in conjunction with a report database **200** may be provided for managing the reporting functions of these systems. In accordance with the invention, the report server **210** and the report database **200** may be added to an individual multimedia communications system **99** or also to a networked organization **199** of individual multimedia communications systems **99** so as to provide reporting services to administrative computers or user workstations **40** within one or more multimedia collaboration systems **99**. The reporting server **210** may be coupled to one or more multimedia collaboration systems **99** directly, and/or via an intranet or even the Internet **80**, such as is shown in Figs. 1 and 2. Those skilled in the art will understand that a reporting server **210** and a reporting database **200** may be implemented on a single computer system or in any number of decentralized fashions without departing from the invention.

Fig. 3 illustrates some examples of high-level call events that can be captured from within multimedia network environments **199, 99** and which may be monitored by the multimedia collaboration system environments **199, 99** so that diagnostic and other informative reports may be generated. To best illustrate these examples of high-level call events, a two-party point-to-point WAN **281** call between two users **262, 272** each on separate local (or "internal") networks **261, 271** that are connected by the WAN **281** by means of gateways **263, 273** is illustrated in Fig. 3.

As shown in Fig. 3, network control entities, such as AVNMs **260, 270** govern the exchange of exemplary system control messages. Examples of such control messages may include connection request messages, remote network manager server requests, callee requests, acknowledgement messages, and connection establishment messages. Of course other control messages may be provided and the above are merely exemplary.

It should be noted that no single entity of the users **262, 272** and network control entities **260, 270** provide for full accounting of all the message transactions between the entities involved in a communication link. Thus, in accordance with the invention, a report server **210** can be provided (such as shown in Fig. 2) to retrieve the information from the multiple entities. Additional system services may be added to the architecture shown in Fig. 3. For example, such additional services may include network-oriented services, such as multi-point conferencing or event video broadcast, or be provided by attached entities such networked video storage servers, such as that described in Patent Cooperation Treaty Application Numbers PCT/US99/01789 and PCT/US98/23596. In these expanded situations, the number of decentralized entities, control messages, and potential points of failure and billing increase, making reporting more valuable while at the same time making the event logging tasks more complex.

Fig. 4 is a block diagram showing an exemplary implementation for a reporting environment in a multimedia network environment, such as that shown in Fig. 1. In general, such multimedia network environments include not only a "focus" or "internal" network **201** but also one or more external networks **202**. These external networks **202** may include networks similar to the internal network **201** or they may include networks which are completely dissimilar (such as a public WAN). In addition, the multiple networks **201, 202** are typically used directly or indirectly to provide various services to users. In some cases the services (such as transport) may be provided directly by the network(s), while in other cases the services may be provided in whole or in part by external service-providing entities **203** (such as stand-alone video-on-demand systems).

In accordance with the invention, in a call-reporting environment, each of the networks and service entities **201, 202, 203** provides some information either directly (such as event logs) or indirectly (such as WAN call progress signals) which can be accessed as used for reporting purposes. This information can be provided in real-time and/or through later bulk information transfers (such as a monthly WAN report file). The information is then formatted by a system **204** configured to format the data into a format usable within the reporting system. The formatting step(s) may be performed in a centralized or a decentralized fashion. The resultant information formatting may be automatic, manual, or a combination of the two. The formatted information may then be loaded into a database **200**. The database **200** may be

centralized or decentralized, and the information loading may be automatic, manual, or a combination of the two. In accordance with the invention, the information in the database **200** can then be queried, processed and reported in a number of ways.

For example, in accordance with the invention, one way the information in the database **200** can then be queried, processed and reported is through use of standard report generation. To implement standard report generation, a standard report filter/formatter **206** may be provided. As utilized herein, a standard report filter/formatter **206** refers to one or more fixed, conditional, or parameterized report templates **207**. A report template **207** (and any conditional or parameterized choices therein) may be selected according to the report or reports desired by a user of the reporting system.

The selection and subsequent generation of reports may be driven by report request events **220**. For example, these requests may be generated by users directly or automatically as part of a script and/or a calendar-driven automated procedure. Based on the information requested by the report template **207**, queries can be made from the standard report filter/formatter **206** to the database **200**. In some cases, the data from the database **200** can be placed directly into fields in the template or some equivalent implementation of this action. In other cases, calculations such as sums, averages, ratios, etc., and/or conditional tests (such as <, >, =, etc.) may be performed. In accordance with the invention, these calculations may be done within the standard report filter/formatter **206** or by an external calculation module **208**. The calculations may include billing operations, which involve additional information such as billing rates, billing algorithms, etc., which in turn may be part of the standard report filter/formatter **206**, may be provided by the calculation module **208**, by a separate repository entity **240**, or explicitly provided as part of the report request event **220**. In the case where a separate repository entity **240** may provide the calculations, the separate repository entity **240** may communicate directly with a calculation module **208** and/or directly with the standard report filter/formatter **206**.

In any case, in accordance with the invention, the standard report filter/formatter **206** may use the queried, calculated, and conditionally-tested information to create one or more reports **209a –209n**. It should be noted that a single report request **220** and/or single report template **207** could result in the generation of more than one report **209**.

In accordance with the invention, the reports generated in this manner may be presented to a user via a user interface (which will be described in detail herein) and/or printed (i.e., for direct human consumption) or in the form of machine-readable files (that can be subsequently processed or stored in the database **200**). Further, in accordance with the invention, to the extent that aspects of the standard reports can be enabled/disabled by any parameters provided by the report requests **220**, the standard report filter/formatter **206** can also be used to customize reports to various degrees.

For example, as shown in Fig. 4, flexible general templates **212** (for machine readable report files or human-readable reports) may be submitted to a general filter/formatter **216**. These templates **212** are often more parameterized and/or conditionally structured than the standard report templates **207** but need not be so structured. In accordance with the invention, the general templates **212** may consist of strings of a combination of query, conditional, calculation, and formatting instructions. It should be noted that the general filter/formatter **216** could also be provided with additional support entities such as calculation module **208**, separate repository entities **240**, etc., without departing from the invention. The general filter/formatter **216** could also be further controlled by report request events **220** akin to those utilized by the standard report filter/formatter **206** and described above.

In accordance with the invention, an SQL interface module **226** may be provided for accepting and processing general SQL queries **215** from an external system and for providing reports **216** to an external system. It should be noted that the SQL module **226** could also be provided with additional support entities such as calculation module **208**, separate repository entities **240**, etc., without departing from the invention.

Those skilled in the art will recognize that aspects of the standard report filter/formatter **206**, general filter/formatter **216** and/or SQL module **226** may be integrated as may prove advantageous for an implementation. Therefore, in accordance with the invention, the reporting functionality of the system may be customizable depending on the needs of a user. It should be further understood that additional support entities and functions, such as calculation modules **208** or separate information processing algorithm repositories **240** may be shared across any combination of the standard report filter/formatter **206** function, the general

filter/formatter **216** function, and/or the SQL interface module **226** function as may prove advantageous for an implementation without departing from the invention.

Figs. 5A-C are respective block diagrams illustrating exemplary implementations for handling the inherent decentralization of reporting environments in multimedia network environments in accordance with the invention. In general, multimedia network environments include a number of decentralized entities acting as event sources (shown in Figs. 5A-C as reference numerals **282a – 282k**). Figs. 5A and 5B illustrate exemplary implementations in which each event source may be served directly or indirectly by individual "local" databases **285a – 285k**. These databases may be geographically local, or may be individual for functional reasons. In Fig. 5A, the individual "local" databases **285a – 285k** may pass on their updated information by pull or push models, polled or event driven, to a centralized database **295** which in turn may be queried by a query/filter/format module **286** that may be designed to work with the centralized database **295**. In Fig. 5B, the individual "local" databases **285a – 285k** may be queried directly by a query/filter/format module **286** that may be designed to work with multiple databases **285a – 285k**. In Fig. 5C, each event source **282a – 282k** may directly provide their updated information to a centralized database **295** which in turn may be queried by a query/filter/format functions **286** that may be designed to work with the centralized database **295** . Those skilled in the art will recognize that a combination of the above implementations may be utilized to customize the reporting system to reflect functional and architectural advantages without departing from the invention.

The interaction between components of the reporting system of the invention will now be described with reference to Fig. 6. Fig. 6 is a block diagram illustrating an example of the operational interactions between various hardware, software, and database components in accordance with an embodiment of the present invention in which a web-based interface implementation is utilized. As shown in Fig. 6, in accordance with the invention, the AVNM **34** and/or the A/V Conference Center Manager (ACCM) **35** may be configured to generate and write reporting or event records into a log file **510** that is managed by a database **200**. The database **200** may be implemented using small-scale database products such as Microsoft Access, or in larger-scale applications or where decentralization dictates, other database technologies may be utilized without departing from the invention.

A log file export unit **520** may be configured to retrieve these stored event records from the log file **510** under the direction of one or more objects instantiated from a log class file **530**. In turn, the log class file **530** may be configured to write records into the database **200** and may perform some preprocessing and/or initial parsing upon event record data prior to performing a database write operation. The log class file **530** may also control or direct periodic import operations in conjunction with a configuration file (not shown), such that event records stored in the database **200** can be retrieved and the database **200** can be updated on a regular basis.

In accordance with the invention, the web-based interface implementation depicted in Fig. 6 includes a request class file **550** having an HTML page processing unit **560**, a report display unit **570**, and a custom report unit **580**. The request class file **550** pro vides HTML page templates for performing database management operations, and for generating and saving a wide variety of reports. The page processing unit **560** performs database management and/or database query operations in response to user requests. For example, the page processing unit **560** may retrieve database information in response to a user request including a set of report parameters. As will be described in more detail herein, users accessing the reporting system may specify report parameters via a set-up interface. The page processing unit **560** may filter the results of the database query operation in accordance with one or more such report parameters. The report display unit **570** generates a report in accordance with the user-specified report parameters. The custom report unit **580** facilitates the saving of user-defined reports to the database **200**. It should be noted that the present invention accommodates the creation of user groups. User groups are simply aggregates of real users, aliases and other user groups. Thus, when choosing query criteria, a user can select a combination of user groups, users and/or aliases to report against.

The remaining components shown in Fig. 6 include a manager class file **590** that is a parent of the log class file **530** and the request class file **550**, and which provides an interface between request class file elements **560, 570, 580** and an intranet and/or the Internet **80** so that a user may access the system. In accordance with the invention, user requests and commands to the system may include data management commands, standard report generation requests, and custom report generation requests.

Figs. 7A and 7B are respective exemplary database structures (referred to generally as reference numerals **300a** (Fig. 7A) and **300b** (Fig. 7B)) showing record and field definitions for use in event logging in accordance with the invention. Certain fields in the database schema are composed of data types. Those skilled in the art will recognize that other types of record structures may be used without departing from the invention and that the structures shown in Figs. 7A and 7B are merely exemplary.

One such exemplary field type may include a Call ID character field that uniquely identifies a call record and any hop (i.e., tandem trunk connections through additional switches) records that are associated with that call record. Another example of a field type may be a URL field, a character string having a general URL format (i.e.. <protocol>://<arguments>) describing a system connection (e.g., video) address. Other field type examples include a Caller field identifying a user at the end point of a call chain from which a call is initiated, a Callee field identifying a user at the end point of a call chain to whom a call is placed and a Caller/Callee Name field. The Caller/Callee Name field identifies a service name associated with each party involved in the call. In some architectures, this aspect could exclude connections placed to specialized entities such as multi-point conference bridges and externally connected servers (such as video storage servers). Calls involving such entities may advantageously use alternate naming conventions in the service name. In some implementations of the system of the invention, the callee name may need to be extracted from the URL, such as in the case of calling H.320 addresses. Another field type example is a Callee vs. Received Call field. This field is utilized for managing multi-party calls. For example, the callee designated in this field may not necessarily be the user that received the call. In some cases the user specified by the caller field is actually the user who received the call. For example, in call forwarding situations where party A calls party B and party A forwards the call to party C, the records for the forwarded call may indicate party C as the caller and party B as the callee.

Fig. 8 depicts a general connection environment useful for defining various call types and database fields that are associated with records for such call types. Fig. 8 illustrates at least six functionally different types of supported calls in a multimedia environment. One such call type involves a direct call between User A **800** and User B **802** on the same switch AVNM1 **804** (Call Type 1). Another call type involves a switched call between User A **800** on switch AVNM1 **804a** and User C **806** on a different switch AVNM2 **804b** through one or

more trunks **808** (Call Type 2). A third call type involves a call from User A **800** to Outside Caller D **810** using a gateway on the same switch AVNM1 **804a** (Call Type 3). Another call type involves a call to User A **800** from Outside Caller D **810** using a gateway on the same switch AVNM1 **804a** (Call Type 4). Yet another call type involves a call from User A **800** to Outside Caller E **812** using a gateway on a different switch AVNM2 **804b** (Call Type 5). Finally, a sixth call type involves a call to User A **800** from Outside Caller E **812** using a gateway on a different switch AVNM2 **804b** (Call Type 6).

It should be noted that call types can be extended to include other types of connections, such as broadcast and multiple service interconnection (as in conference recording of a multi-party call which in turn includes as one of its "participants" another video service such as video-on-demand or video-mail) as may be supported by the network without departing from the invention.

Such call type classification schemes can advantageously be used to differentiate the structure call records in accordance with the invention. For example, the number of fields necessary to characterize a call of Type 1 are far fewer than that needed to characterize a call of Types 5 or 6. Some information may be recorded similarly for all call types. For example, in all cases a global unique ID is created for each call (such as by the originating AVNM).

Some exemplary structural variations depending on call type may include a CALL record for maintaining Caller info, Callee info, End-reason information, trunk/gateway information, and next-hop information (if the AVNM is not a destination). If a call involves more than one AVNM, then non-originating AVNMs may log a HOP record to the database **200** that may include a global unique ID, trunk/gateway information and next-hop information (if the AVNM is not a destination).

For multi-point calls, a CONFERENCE record may be logged to the database **200** that may include a Conference Session Unique ID, Conference name information, Start time information, End time information and an AVNM ID. A PARTICIPANT record may also be logged to the database **200** that may include a Conference Session ID, a Call ID, Slot number information and Reason information.

The following represent examples of database entry tables that may be utilized by the system for organizing reporting information in accordance with the invention. Some database entry tables may include call tables and the hops involved in placing calls, multi-point conference bridges and the associated conference participants, arbitrary services, arbitrary servers, sessions and logins. Of course different structures, additional tables, and additional or alternate types of information may be gathered in a variety of ways as is understood by one skilled in the art without departing from the invention.

The following table illustrates an example of a call table described above.

Field	**Type**	**Comments**	**Time Added**
Call ID	String	Unique ID for the call, ID is identical for the call and hop record(s) that comprise the call, forty character field.	Record Created
Server Name	String	Ex. *Machine.domain.com*	Record Created
Call Class	String	LAN, WAN:Dedicated, WAN:Dial	
Caller Name	String	Name of the Caller's service at the time this record is created. For point calls, this field will be updated at the point the actual name arrives. Exs. *Sylvia Brown* *Conference Center* *Media Server*	Call Start

Caller URL	String	URL of the caller's address. Ex. *Avnm://machine.domain.com* *h320://psn/12025551234;name="Sylvia Brown"*	Call Start
Caller Application	String	{Conference, AVDM, ACCM, amsm, Viewer, unknown}	Call Start
Caller Login Name	String	Windows login name of user. Ex. *sbrown*	
Caller Service	String	User, Outside User, Media Server, Conference Center, Broadcast, Device	
In Gateway Type	String	Only present for incoming outside call {Tandberg, UTP, RSI }	Call End
In Gateway Class	String	Only present for incoming outside call. {LAN, DIAL, DEDICATED}	
In Trunk Name	String	Ex. *"tan1"*	
In Gateway URL	String	Only present for incoming outside call Ex. *H320://psn/+12025551234*	Call End
Call Mode	Number	{NONE = 0, RECEIVE = 1, SEND = 2, RECEIVE&SEND = 3}	Call End
Received Call	Boolean	Did the caller receive this call?	Call Start

Callee Name	String	As caller Name	Call Start
Callee URL	String	As caller URL	Call Start
Callee Service	String	User, Outside User, Media Server, Conference Center, Broadcast, Device	
Out Gateway Type	String	As incoming Type	Call End
Out Gateway Class	String	{LAN, DIAL, DEDICATED}	
Out Trunk Name	String	Ex. *"tan1"*	
Out Gateway URL	String	As incoming URL. (may also contain avnm addresses besides h320 addresses)	Call End
Next Hop Server	String	Ex. *Machine.domain.com*	Record Created
Start Time	Time		Record Created
Accept Time	Time	Null if never accepted	Accept
End Time	Time		Call End
Ending Event	String	{Hangup, Error, Forwarded, Redirected, Collapsed}	Call End

Ancestor Call ID	String	Previous ID if call was F orwarded, Redirected or Collapsed.	Call End
End Reason	Number	If Ending Event is an error, contains the error reason. (would also like the error location)	Call End

The following table illustrates an example of an associated hop table described above.

Field	**Type**	**Comments**	**Time Added**
Call ID	String	40 character field that maps to the corresponding Call Record and any corresponding hop records.	Record Created
Server Name	String	Ex. Machine.domain.com	Call End
In Gateway Type	String	Refers to gateway on the side of the previous hop or call record.	Call End
In Gateway Class	String	{LAN, DIAL, DEDICATED}	
In Trunk Name	String	Ex. *"tan1"*	
In Gateway URL	String		Call End
Callee Name	String	Only present on last hop	Call Start
Callee Video Address	String	Only present on last hop	Call Start

Callee Application	String	Only present on last hop	Call Start
Callee Login Name	String	Only Present on last hop Windows login name of user. Ex. *sbrown*	
Received Call	Boolean	Only present on last hop. Did this user receive this call?	Record Created
Out Gateway Type	String	Refers to gateway on the side of subsequent hop or call record.	Call End
Out Gateway Class	String	{LAN, DIAL, DEDICATED}	
Out Trunk Name	String	Ex. *"tan1"*	
Out Gateway URL	String		Call End
Next Hop Server	String	Ex. *Machine.domain.com*	Call Start
End Reason	Number	The ending event is stored in the hop records as some errors are remapped by the time it gets to the call record (losing the original, more specific error)	Call End

The following table illustrates an example of a multi-point conference bridge table described above.

Field	Type	Comments
Conf Session ID	String	A 40 character unique ID to identify this session.
Server Name	Number	Ex. *Machine.domain.com*
Conf Device Name	String	Ex. *Default:4*
Start Time	Time	Time when the request was made to find a Conference Center.
End Time	Time	Time when the conference ended.
End Error	Number	PVW error code.
End reason	String	If End Error is 0, this contains the reason for the call ending. {"Adjourned", "Collapsed", "Only 1 Participant", "No RS User", "All Busy"}

The following table illustrates an example of an associated conference participant table described above.

Field	Type	Comments
Conf Session ID	String	Matches the corresponding value in the Conferece Record.

Call ID	String	Identifies the Call Record associated with this participant.
Participant Name	String	Name of participant
Participant URL	String	URL of Conference Center port of participant
Inviter ID	String	Call ID of participant that added this user to the conference. In the case of the originator this will be their own call ID.
Slot Number	Number	{-1,0,1,2,3} 0 thru 3 are the users displayed in the quad. –1 is a user viewing the conference on the broadcast port.
IsOriginator	Bool	True for the one participant who started the conference call.
Active Participant	Bool	Does this user have a TCP connection to the ACCM.
Start Time	Time	When a slot was allocated for this participant.
Accept Time	Time	Time when participant accepted call (or if conference center was called, time when it accepted call)
End Time	Time	When the slot for this participant released.
End Error	Number	PVW error code

End reason	String	If the End error is 0, this contains the reason for the user leaving the Conference. {"User Hangup", "Conference Hangup", "Conference Adjourn", "User Adjourn"}

The following table illustrates an example of an arbitrary services table described above.

Field	**Type**	**Comments**
Service Index	Number	Unique ID that is incremented for each new service.
Service Name	String	Name of the service. Ex *"Sylvia Brown"*
Server Name	String	Ex. *Machine.domain.com*
Session Index	String	ID that matches to the corresponding session.
Service Class	String	{ "Any","Videophone","Conference", "VFSD", "Service", "Admin", "VfsTool", Share", "Remote" "wandaemon", "Receptionist", "ShareServer" "NetMeeting", "Presentation", "Audience" "Broadcast", "Stream", "Sink"}

Login Name	String	The user's Windows login name. This field will be empty for such services as ACCM and AVDM.
Service Port	String	Ex. *Sonic*
Start Time	Time	Time at which service was created.
End Time	Time	Time when the service logged out or disconnected.

The following table illustrates an example of an arbitrary servers table as described above.

Field	**Type**	**Comments**
Server Index	Number	Unique ID beginning at 0 for each Server Name and type pair.
Server Name	String	Ex. *machine.domain.com*
Location	String	Ex. *"Redwood Shores 3rd floor"*
Server Type	String	{ "Avistar Video Network Manager", "Avistar Conference Center Manager", "Avistar Video Device Manager", "Avistar Media Server"}

The following table illustrates an example of a session table as described above.

Field	Type	Comments
Session Index	String	A 40 character unique field that uniquely identifies this session.
Server Name	String	Ex. *Machine.domain.com*
Server Index	Number	Queried for and filled in by ACLM by querying the server table with the se rver name.
Server Version	String	Ex. *AVNM Version 5.6.b.8, protocol 12.3*
Server Location	String	Ex. *"Redwood Shores"*
Login Time	Time	
Last Heard Time	Time	
Logout Time	Time	

The following table illustrates an example of a login table described above.

Field	Type	Comments
Server Name	String	Ex. *Machine.domain.com*
Login Name	String	The name that the user used to log in to their computer.

Appendix A to this specification lists a series of reporting and billing algorithms that may be utilized by the present invention. Of course, those skilled in the art will understand that other implementations of the appended algorithms, as well as additional algorithmic functions relating to information processing for reporting may be utilized without departing from the invention.

In reviewing Appendix A, reference to the following description may be beneficial in order to fully contemplate the scope of the appended algorithms. With regard to calls, Call Records and Hop Records, there is a one-to-one correspondence between calls and Call Records. All data related to a call is defined in one Call Record and zero or more Hop Records. All Call ID values in the Call Record table are unique. All Hop Records associated with a Call Record have the same Call ID as in the Call Record.

With regard to call duration, the duration of a (two-party) call is the Call Record End Time minus the Call Record Accept Time. The duration of a conference call is the Conference Record End Time minus the Conference Record Start Time. The duration of a call into a Conference Center is calculated from the Participant record (i.e., the Participant Record End Time minus the Participant Record Accept Time). It should also be noted that the handling of geographic time zones are provided by the system of the invention. For example, the use of globally implemented "absolute time" (Greenwich Mean Time), or the use of context-specific local time that may be an extension of GMT, may be provided to generate a desired report and to maintain information about the MCS.

With regard to call classification, calls generally fall into three classes: LAN, WAN Dial, and WAN Dedicated. A call is classified as a LAN call when the call has no associated hop records and both the In Gateway Type and Out Gateway Type fields are NULL or when its Out Gateway Type field is UTP, its Out Gateway Class is Dedicated, and all its subsequent hop records have In Gateway Type and Out Gateway Type values that are NULL or UTP. If neither of these conditions are true, then the call is classified as a WAN call. WAN calls are further partitioned into Dedicated and Dial calls based on the contents of the In Gateway Class and Out Gateway Class fields in the Call and Hop records. If the value of either of these fields

in the Call Record or in any Hop Record is DIAL, then the call is classified as a WAN Dial call. Otherwise the call is classified as a WAN Dedicated call.

Callers and callees can be designated as actual users or they can be designated as services, meaning that they do not represent an actual user. This designation is determined by the Caller Service and Callee Service fields. Only "User" and "Outside User" are actual users. All other values indicate services. Services can be the originator of a call only if both the caller and callee of the call are services.

Regarding originate vs. receive designation, the caller in a Call Record is designated as the Receiver of the call when the caller is an Actual User and the Received Call field is TRUE, the caller and callee are services and the Received Call field is TRUE or when the callee is a service. The callee in a Call Record is designated as the Receiver of the call when the Callee Class is User or Outside User and the Received Call field is FALSE, the caller and callee are services and the Received Call field is FALSE or when the Caller Name is neither User nor Outside User. The caller in a Call Record is designated as the Originator of the call when the callee is the Receiver. The callee in a Call Record is designated as the Originator of the call when the caller is the Receiver.

Call Record and Hop Record completion status can be one of three possible values: not completed due to no allocated resources; not completed due to failure; and available for completion. Several situations result in a Call Record or Hop Record not being completed due to no allocated resources. For example, a Call Record or Hop Record is not completed due to no allocated resources if Local Error Type is "Out" and Local Error is PVW_TRUNK_NO_REMOTE (–54), PVW_TRUNK_NOT_REACHABLE (-59), PVW_NO_TRUNK (-29), PVW_TRUNK_IN_USE (-55), PVW_TRUNK_GATEWAY_RESETTING (-73), PVW_TRUNK_DOWN (-53), PVW_TRUNK_ISDN_DOWN (-63), PVW_DEDICATED_LINES_ARE_DOWN (-109), PVW_SYNC_FAILED (-110) or if Local Error Type is "Switch" and Local Error is PVW_XBAR_BUSY (–76). A Call Record or Hop Record is available for completion if Local Error Type is "In" or if Local Error Type is "Out" and Local Error is PVW_OK (0), PVW_REFUSED (–8) or PVW_RING_TIMEOUT (–47). A Call Record or Hop Record is not completed due to failure in all other cases.

Call Record and Hop Record have busy status classifications of local, remote, or none. Call Record and Hop Record busy status is classified as local if Local Error Type is "Out" and Local Error is PVW_TRUNK_NOT_REACHABLE (-59), PVW_NO_TRUNK (-29), PVW_TRUNK_IN_USE (-55), PVW_TRUNK_GATEWAY_RESETTING (-73), PVW_TRUNK_DOWN (-53), PVW_TRUNK_ISDN_DOWN (-63), PVW_DEDICATED_LINES_ARE_DOWN (-109) or PVW_SYNC_FAILED (-110). Call Record and Hop Record busy status is classified as remote if Local Error Type is "Out" and Local Error is PVW_TRUNK_NO_REMOTE (–54). In any other case, the busy status is classified as none.

Returning now to the specification, users of the reporting system, which may include system administrators, information-privileged users, or general users, may generate requests and commands that are directed to the reporting server **210** via a user interface in accordance with the invention. The reports in turn may be delivered by the same or related user interface. In general, the user interface may be essentially any type of text-based, Graphical User Interface-(GUI) based, networked GUI-based (as with the X Windows system, for example), or web-based interface employing conventional browser-based software such as Netscape Navigator or Microsoft Internet Explorer. For example, in an embodiment of the invention, web-based communication between a reporting server **210** and a set of user workstations **40** can be implemented or facilitated through the use of a conventional Java Servlet engine, conventional web server and web browser software, conventional database driver software, and data export/transfer software.

Conventional GUIs often involve one or more user interface implementation environments. Before the establishment of the browser-based World Wide Web, stand-alone custom interactive graphical displays were utilized by systems whose software operated directly in the native window system environment of the desktop computer. These implementations are still those of choice today for applications where performance, non-web usage, or architectural factors motivate or dictate this approach. However, the conventional approach has a number of liabilities including dependence on specific details of window systems, operating systems, and other platform aspects as well as administrative complications in versioning, maintenance, upgrading, etc.

In many situations, particularly where any one or more of networked applications, location independence, platform independence, frequent version upgrades, or access to shared databases are involved, GUIs are increasingly implemented as interactive web-based displays accessed by and operating within the environment of a web-based browser. In these situations, the GUI application software operates within the browser environment and relies on the browser environment to interface in surrogate with the native window system environment of the specific platform.

Figs. 9A1-9C2 illustrate alternatives of user interface implementation environments that can be utilized by the present invention. In each of the Figs. 9A1-9C2, a dotted box **601** is used to denote the window system environment of the desktop computer. Figs. 9A1 and 9A2 show respective implementations of application GUIs **602, 603, 604** which operate within the window system environment **601**. In Fig. 9A1, the user interface may be provided by a single comprehensive GUI **602**. Fig. 9A2 illustrates an alternative case in which one GUI **603** may serve as a principle user interface and launch secondary feature-specific GUIs **604** as needed.

Figs. 9B1 and 9B2 illustrate hybrid interface implementations which combine windows-based GUIs (reference numbers **622** (Fig. 9B1) and **632** (Fig. 9B2)) and web-based GUIs (reference numbers **625, 626** (Fig. 9B1) and **635, 636** (Fig. 9B2)). The web-based application GUIs **626, 636** shown in Figs. 9B1 and 9B2 operate in the browser environment **625, 635**, respectively. Depending on the implementation, either the windows-based GUI **622** or the browser based GUI **635** may serve as a principle user interface and launch secondary feature specific GUIs as needed.

As shown in Fig. 9C1, with the addition of a browser **605** to the window system environment **601**, it is possible to include "web-based" application GUIs **606** which operate in the browser environment **605** as described above. The addition of web-based GUIs **606** permits a number of additional implementation options. For example, the implementation depicted in Fig. 9A1 can be modified to utilize web-based GUIs **606** as shown in Fig. 9C1. Alternatively, when the launch of secondary feature-specific GUIs are involved, such as is shown in Fig. 9C2, window-system GUIs **645, 655** and web-based GUIs **646, 656** can be used in combination with each other.

As mentioned above, the application user interface implementation methods of Figs. 9A1 and 9A2 have been used exclusively in the past, while the implementation methods of Figs. 9C1 and 9C2 are seen as the way of the not-too-distant future. In the interim, combination methods involving arrangements such as depicted in Figs. 9B1 and 9B2 have value in that they deliver or are perceived to deliver higher degrees of performance and security. The present invention can be implemented using any of the interface methods depicted in Figs. 9A1-9C2, as well as in variations clear to those familiar with the art.

Fig. 10 is an example of a browser-based data management interface **1000** for importing records into the database **200** in accordance with the invention. The data management interface **1000** may be configured to execute on a user workstation **40**, and is responsive to user-specified input for controlling conditions (indicated as reference numeral **1001**) determining how the report server **210** (shown in Fig. 2) updates its associated report database **200**.

Fig. 11 is another example of a browser-based data management interface **1100** for deleting records from the database **200** in accordance with the invention. The data management interface **1100** is responsive to, and permits execution of, user input that specifies conditions (indicated as reference numeral **1101**) under which all or some reporting records may be deleted from the database **200**. In an embodiment of the invention, only a system administrator or information-privileged user can provide valid input to the data management interfaces **1000** (Fig. 10) and **1100** (Fig. 11), respectively. However, other permission schemes and/or hierarchies may be provided without departing from the invention.

Fig. 12 is an exemplary menu **1200** from which a user may select a variety of standard reports in accordance with the invention. For example, reports such as calls between users, user call detail, number of calls completed by a user, call duration, total device usage by the number of calls, total device usage by duration, and total device usage by time period may be generated by the reporting system. Examples of these reports will be described in detail herein.

Fig. 13A is an example of a set-up interface **1300** for determining report generation parameters for generating a calls between users report **1350** (shown in Fig. 13B). The set-up interface **1300** provides a user with descriptive report information **1301**, and facilitates user selection of

user groups **1302**, time ranges **1303**, sort order **1304**, and report display format **1305**. Fig. 13B depicts an exemplary report **1350** of calls among all or specified users. As shown, the report **1350** indicates an account of calls made between users for a given time period using a sort order that consists of sorting at a first level by user and at a second level by time. For each call represented, the report **1350** identifies a call originator, a LAN call recipient and/or recipients or a WAN call recipient or recipients, a starting time, and a duration.

Fig. 14A is an example of a set-up interface **1400** for determining report generation parameters for generating a user call detail report **1450** (shown in Fig. 14B). The set-up interface **1400** provides a user with descriptive report information **1401** and facilitates user input for the selection of a user group **1402**, a call type **1403**, a time range **1404**, a sort order **1405**, and a report display format **1406**. Fig. 14B depicts an exemplary user call detail report **1450**, which indicates details of calls among a group of users for originating and receiving calls spanning a particular time period. For each call, the report **1450** identifies a call originator, a LAN call recipient or recipients or a WAN call recipient or recipients, a starting time, and a duration.

Fig. 15A is an example of a set-up interface **1500** for determining report generation parameters for generating a number of calls completed by user report **1550** (shown in Fig. 15B). The set-up interface **1500** provides a user with descriptive report information **1501**, and facilitates user input of a user group **1502**, a call type **1503**, a time range **1504**, a sort order **1505** , and a report display format **1506**. Fig. 15B depicts an exemplary number of calls completed by user report **1550**, which graphically indicates a number of LAN calls and/or WAN calls originated and/or received by a specified user or users and/or group or groups of users within a specified time interval.

Fig. 16A is an example of a set-up interface **1600** for determining report generation parameters for generating a number of calls completed by time period report **1650** (shown in Fig. 16B). The set-up interface **1600** provides a user with descriptive report information **1601** and facilitates user selection of a user group **1602**, a call typ e **1603**, a time range **1604**, a time period **1605**, a sort order **1606** and a report display format **1607**. Fig. 16B depicts an example of a number of calls completed by time period report **1650**, which indicates a number of calls using an indicated type of network connection that were originated and/or received by a specified group of users during a specified time period.

Fig. 17A is an example of a set-up interface **1700** for determining report generation parameters for generating a call duration report **1750** (shown in Fig. 17B). The set-up interface **1700** provides descriptive report information **1701** and facilitates user input of a user group **1702**, a call type **1703**, a time range **1704**, a sort order **1705** and a report display format **1706**. Figs. 17B-17D depict respective examples of call duration reports **1750**, which depict cumulative call durations for LAN calls and/or WAN calls associated with one or more specified groups of users and a specified time interval.

Examples of three additional reports that may be generated according to specified parameters as described above are shown in Figs. 18A-18C. Fig. 18A is an example of a user call total by time period report **1800** that includes a bar chart representing the cumulative minutes of use for LAN calls, WAN calls made using a dial-up connection and/or WAN calls made using a dedicated connection during a specified time range broken down by month.

Fig. 18B is an example of a network availability by number of calls report **1825** that includes a bar chart representing the results of calls using the specified networks during a specified time period. As shown in Fig. 18B, possible report indicators include available for completion, not completed due to unavailable resources, and/or not completed due to network or other system error.

Fig. 18C is an example of a network availability by percentages of calls report **1850** that includes a bar chart representing the percentages, rather than numbers, of calls available for completion, not completed due to unavailable resources, and/or not completed due to error during a specified time period.

Fig. 19A is an example of a set-up interface **1900** for determining report generation parameters for generating a total device usage by number of calls report **1950** (shown in Fig. 19B). The set-up interface **1900** provides descriptive report information **1901** and facilitates user specification of a device or devices **1902**, a time range **1903**, a sort order **1904** and a report display format **1905**. Fig. 19B is an exemplary device usage by number of calls report **1950** that indicates a total number of inbound and/or outbound calls for a set of specified devices during a specified time interval.

Fig. 20A is an example of a set-up interface **2000** for determining report generation parameters for generating a total device usage by duration report **2050** (shown in Fig. 20B). The interface **2000** provides descriptive report information **2001**, and facilitates user specification of a set of devices **2002**, a time period **2003**, a sort order **2004** and a report display format **2005**. Fig. 20B depicts an exemplary device usage by duration report **2050**, which indicates a cumulative inbound and outbound use time for a specified set of devices during a specified time period.

Figure 21A is an example of a set-up interface **2100** for determining report generation parameters for generating a total device usage by time period report **2150** (shown in Fig. 21B). The set-up interface **2100** provides descriptive report information **2101**, and facilitates user input to specify a device set **2102**, a time range **2103**, a time period **2104**, a sort order **2105** and a report display format **2106**. Fig. 21B depicts an exemplary total device usage by time period report **2150**, indicating a cumulative inbound and outbound usage time for a specified set of devices during a specified time period.

Examples of four additional reports that may be generated according to specified parameters as described above are shown in Figs. 22A-22D. Fig. 22A depicts an exemplary conference center usage by numbers of uses report **2200** that includes a bar chart representing the number of uses of conference centers in the specified MCSs. Fig. 22B depicts an exemplary conference center usage by cumulative time used report **2225** that includes a bar chart representing the cumulative time of use of conference centers in the specified MCSs during the specified time interval. Fig. 22C depicts an exemplary conference center busy by percentage of attempted uses report **2250** that includes a bar chart representing the percentage of times that a conference center was busy on the specified MCS when it was called during the specified time period. It should be noted that similar reports (with corresponding set-up interfaces) can readily be provided for other network devices. For instance, reports of usage by number of uses and usage by cumulative time used can be provided for switches **32** and AVSSs **100**, and reports of being in use can be provided for AVSSs **100**.

Fig. 22D depicts an exemplary conference call availability report **2275** that includes a bar chart representing, for specified networks during a specified time period, the number of conference calls available for completion, the number of conference calls not completed due to

unavailable resources and the number of calls not completed due to network error. Unlike the reports shown in Figs. 22A-22C which concern a network device conference center **36**, the report **2275** shown in Fig. 22D concerns a service conference call report. Accordingly, the representations in the bar chart of calls not completed due to insufficient resources represent not only cases in which conference centers **36** are unavailable, but also cases in which other network resources are unavailable, such as AVSSs **100**, if those resources are utilized for the call. Similarly, the representations in Fig. 22D of calls not completed due to system error represent not only cases in which there are errors in conference centers **36**, but also cases in which there are errors in other network resources. Likewise; the representations of calls available for completion represent cases in which not only conference centers **36** are available and working, but all other necessary network resources are as well. It should be noted that reports like that depicted in Fig. 22D depicting conference call availability can be provided for other multimedia or collaborative services as well. For example, reports may be provided for two-party videoconferences, video-on-demand, video recording, and videoconference recording, such as are disclosed in U.S. Patents No. 5,617,539 and in Patent Cooperation Treaty Application Numbers PCT/US99/01789 and PCT/US98/23596.

Fig. 22E depicts an exemplary trunk busy report **2290** that includes a detailed listing for networks over a specified time period, a summary of the number of busy trunks during the specified time period. Although conference centers and trunks are specifically illustrated in the above reports, those skilled in the art will recognize that any service or shared hardware resources could be designated by the reporting features of the present invention and the above illustrations are merely exemplary.

Fig. 23 is an example of a menu **2300** from which a user may select a variety of user-defined custom reports in accordance with the invention. Custom reports may be derived from standard reports, such as those shown in Figs. 13A-22D, and may be defined and saved in the database **200** in accordance with specified settings or parameters. Alternatively, a user may select from a list of variables and/or parameter choices and define particular conditions to create a unique custom report.

Fig. 24 is an example of a custom report interface **2400** for saving custom reports to the database **200** in accordance with the invention. Fig. 25 is an example of a custom report save

notification interface **2500** in accordance with the invention for indicating the success or failure of a saved report to the database **200**.

While the reports described herein were illustrated according to specific embodiments, those skilled in the art will recognize that the information contained in the reports can be presented according to any presentation implementation. Moreover, the reports can be printed or otherwise output using a vast number of different kinds of media without departing from the invention. Additionally, machine readable report files can be provided in commonly read file formats, such as "comma separated values" or any other similar file format scheme.

While the foregoing has been described with reference to particular embodiments of the invention, such as the implementation of a multimedia collaboration reporting system, the invention is not limited to such embodiments described herein. It will be appreciated by those skilled in the art that changes in these embodiments may be made without departing from the principles and spirit of the invention. For example, in an alternative web-based embodiment of the invention, the database **200** may store a plurality of system events and database query and calculation commands may actually be embedded in the web page code such that the database queries may be carried out without use of network accessed report query filter format servers **206, 216** and the like. Additionally, the utilization of a database **200** may be also eliminated by in some embodiments of the invention.

WHAT IS CLAIMED IS:

1. A multimedia collaboration reporting system for use in at least one underlying multimedia collaboration system network, comprising:

an event monitoring module for monitoring any one or more of internal network system events, external network system events and service events;

a database module for recording the monitored events therein and for classifying the monitored events according to predetermined characteristics and attributes; and

a reporting module for receiving query parameter information from a user and for generating a report in accordance with the query parameter information.

2. The multimedia collaboration reporting system of Claim 1, wherein there are a plurality of multimedia collaboration system networks and wherein one of the modules is centralized to a particular one of the plurality of multimedia collaboration system networks.

3. The multimedia collaboration reporting system of Claim 1, wherein there are a plurality of multimedia collaboration system networks and wherein any of the modules are decentralized by being distributed among the plurality of multimedia collaboration system networks.

4. The multimedia collaboration reporting system of Claim 3, wherein the decentralization of any of the modules results in a first system architecture that mirrors a network architecture which is common to a selected one of the multimedia collaboration system networks.

5. The multimedia collaboration reporting system of Claim 1, wherein the events include one or more of server startup events, server shutdown events, user login events, user logout events, call events, call error events, service events and service error events.

6. The multimedia collaboration reporting system of Claim 5, wherein the server startup events are maintained in a startup record stored in the database.

7. The multimedia collaboration reporting system of Claim 6, wherein the startup record includes any of startup time information, error code information, error string information and supplemental information.

8. The multimedia collaboration reporting system of Claim 5, wherein the server shutdown events are maintained in a shutdown record stored in the database.

9. The multimedia collaboration reporting system of Claim 8, wherein the shutdown record includes any of shutdown time information, error code information, error string information and supplemental information.

10. The multimedia collaboration reporting system of Claim 5, wherein the user login events are maintained in a user login record stored in the database.

11. The multimedia collaboration reporting system of Claim 10, wherein the user login record includes any of user ID information, login time information, client information and supplemental information.

12. The multimedia collaboration reporting system of Claim 5, wherein the user logout events are maintained in a user logout record stored in the database.

13. The multimedia collaboration reporting system of Claim 12, wherein the user logout record includes any of user ID information, logout time information, client information and supplemental information.

14. The multimedia collaboration reporting system of Claim 5, wherein the call events are maintained in a call record stored in the database.

15. The multimedia collaboration reporting system of Claim 14, wherein the call record includes any of caller information, call session information, callee information and timing information.

16. The multimedia collaboration reporting system of Claim 5, wherein the call error events are maintained in a call error record stored in the database.

17. The multimedia collaboration reporting system of Claim 16, wherein the call error record includes any of call failure information, session information, call information and timing information.

18. The multimedia collaboration reporting system of Claim 5, wherein the service events are maintained in a service record stored in the database.

19. The multimedia collaboration reporting system of Claim 18, wherein the service record includes any of service resource information, session information and timing information.

20. The multimedia collaboration reporting system of Claim 5, wherein the service error events are maintained in a service error record stored in the database.

21. The multimedia collaboration reporting system of Claim 20, wherein the service error record includes any of service resource problem information, operational error information, session information and timing information.

22. The multimedia collaboration reporting system of Claim 1, wherein the database comprises a plurality of localized databases, each database configured to store the monitored event information from a particular multimedia collaboration system network and a centralized database configured to centrally maintain the stored information from each of the plurality of localized databases.

23. The multimedia collaboration reporting system of Claim 1, wherein the database comprises a centrally located database configured to maintain the monitored event information.

24. The multimedia collaboration reporting system of Claim 1, wherein the database comprises a plurality of localized databases, each database configured to store the monitored event information from a particular multimedia collaboration system network.

25. The multimedia collaboration reporting system of Claim 1, wherein the reporting module is configured to generate either standard or customizable reports relating to the operation of the

multimedia collaboration system network in response to the database query parameter information.

26. The multimedia collaboration reporting system of Claim 1, wherein the reporting module includes a web-based interface for providing either of a web-based query or response interactivity to the reporting such that a database query can be formulated and provided via the Internet.

27. The multimedia collaboration reporting system of Claim 1, wherein in response to the query parameter information, the reporting module performs either of predetermined calculations or conditional tests on the event information stored in the database in order to generate a report.

28. The multimedia collaboration reporting system of Claim 1, wherein the report is formulated as a machine readable report file.

29. The multimedia collaboration reporting system of Claim 28, wherein the report is formulated as a comma separated value report file.

30. The multimedia collaboration reporting system of Claim 1, wherein the report is formulated as a combination of textual and graphical data.

31. A multimedia collaboration system for conducting a conference among a plurality of participants comprising:

a multimedia collaboration system network, including

a plurality of workstations each having a monitor for displaying visual images and A/V capture and reproduction capabilities for capturing and reproducing video images and spoken audio of the participants;

a data network providing a data path along which data can be shared among the plurality of the workstations; and

a data conference manager for managing the sharing of data between the plurality of workstations; and

an independent reporting system connected with the multimedia collaboration system network and configured to provide reporting analysis of the multimedia collaboration system network, the independent reporting system including

a network control system configured to monitor one or more of internal, external or service event information affecting the multimedia collaboration system network;

a database configured to store the monitored event information;

a database query system configured to format a database query according to query parameter information and to query the database in accordance with the database query parameter information; and

a report generation system configured to generate an analysis report from the monitored event information stored in the database in accordance with the database query parameter information.

32. The multimedia collaboration system of Claim 31, wherein the database comprises a plurality of localized databases, each database configured to store the monitored event information from a particular multimedia collaboration system network and a centralized database configured to centrally maintain the stored information from each of the plurality of localized databases.

33. The multimedia collaboration system of Claim 31, wherein the database comprises a centrally located database configured to maintain the monitored event information.

34. The multimedia collaboration system of Claim 31, wherein the database comprises a plurality of localized databases, each database configured to store the monitored event information from a particular multimedia collaboration system network.

35. The multimedia collaboration system of Claim 31, wherein the database query system includes any of a standard filter formatter, a general filter formatter and an SQL interface formatter.

36. The multimedia collaboration system of Claim 31, wherein the report generation system is configured to generate either standard or customizable reports about the multimedia collaboration system network in response to the database query parameter information.

37. The multimedia collaboration system of Claim 31, wherein the reporting module includes a web-based interface for providing either of a web-based query or response interactivity such that a database query can be formulated and provided via the Internet.

38. The multimedia collaboration system of Claim 31, wherein in response to the query parameter information, the reporting module performs either of predetermined calculations or conditional tests on the event information stored in the database in order to generate a report.

39. The multimedia collaboration system of Claim 31, wherein the report is formulated as a machine readable report file.

40. The multimedia collaboration system of Claim 39, wherein the report is formulated as a comma separated value report file.

41. The multimedia collaboration system of Claim 31, wherein the report is formulated as a combination of textual and graphical data.

42. A multimedia collaboration system for conducting a conference among a plurality of participants comprising:

a multimedia collaboration system network, including

a plurality of workstations each having a monitor for displaying visual images and A/V capture and reproduction capabilities for capturing and reproducing video images and spoken audio of the participants;

a data network providing a data path along which data can be shared among the plurality of the workstations; and

a data conference manager for managing the sharing of data between the plurality of workstations; and

an independent reporting system connected with the multimedia collaboration system network and configured to provide reporting analysis of the multimedia collaboration system network, the independent reporting system including

a network control system configured to monitor one or more of internal, external or service event information affecting the multimedia collaboration system network;

a database configured to store the monitored event information;

a web-based database query system configured to format a database query according to query parameter information and to query the database in accordance with the database query parameter information; and

a report generation system configured to generate an analysis report from the monitored event information stored in the database in accordance with the database query parameter information.

43. A method for generating reports identifying multimedia collaboration system events, comprising the steps of:

monitoring one or more of internal network system events, external network system events and service events and recording the monitored events to a database, the stored events being classified in the database according to a predetermined set of characteristics and attributes;

querying the database with a set of query parameter information to generate an analysis report; and

generating the analysis report in accordance with the query parameter information.

44. A reporting system, comprising:

a network control system configured to monitor one or more of internal, external or service event information of a multimedia collaboration system network;

a database configured to store the monitored event information;

a database query system configured to format a database query according to query parameter information and to query the database in accordance with the database query parameter information; and

a report generation system configured to generate an analysis report from the monitored event information stored in the database in accordance with the database query parameter information.

45. The reporting system of Claim 44, wherein the database query system includes any of a standard filter formatter, a general filter formatter and an SQL interface formatter.

46. The reporting system of Claim 44, wherein the report generation system is configured to generate either standard or customizable reports relating to the operation of the multimedia collaboration system network in response to database query parameter information.

47. The reporting system of Claim 44, wherein the reporting module includes a web-based interface for providing either of a web-based query or response interactivity such that a database query can be formulated and provided via the Internet.

48. The reporting system of Claim 44, wherein in response to the query parameter information, the reporting module performs either of predetermined calculations or conditional tests on the event information stored in the database in order to generate a report.

49. The reporting system of Claim 44, wherein the report is formulated as a machine readable report file.

50. The reporting system of Claim 49, wherein the report is formulated as a comma separated value report file.

51. The reporting system of Claim 44, wherein the report is formulated as a combination of textual and graphical data.

52. A reporting system, comprising:

a network control system configured to monitor one or more of internal, external or service event information of a multimedia collaboration system network;

a database configured to store the monitored event information;

a web-based database query system configured to format a database query according to query parameter information and to query the database in accordance with the database query parameter information; and

a report generation system configured to generate an analysis report from the monitored event information stored in the database in accordance with the database query parameter information.

APPENDIX A

The following appendix lists some example high-level descriptions of various reporting algorithms that may be implemented by the present invention. Reference should be made to the specification to determine the scope of each of the following algorithms. The algorithms included in this appendix are User Call Total (A.1), User Call Summary (A.2), User Call Detail (A.3), User Call Total by Time Period (A.4), Network Availability (A.5), System Usage Between Switches (A.6), Trunk Busy (A.7), Conference Center Usage (A.8), and Conference Center Busy (A.9). Of course, those skilled in the art will recognize that other implementations of these algorithms, as well as additional algorithmic functions relating to information processing can be utilized without departing from the invention and the foregoing is provided merely as exemplary algorithms.**A.1 - User Call Total**

Switch
Originate:
Find all records with Accept Time and End Time in selected time range in which
Caller Name matches selected name and caller is originator, or
Callee Name matches selected name and callee is originator.
Receive:
Find all records with Accept Time and End Time in selected time range in which
Caller Name matches selected name and caller is receiver, or
Callee Name matches selected name and callee is receiver.
Originate and Receive:
Find all records with Accept Time and End Time in selected time range in which Caller Name or Callee Name matches selected name
For each Call Record
List by user and call class, rounding class and user totals to nearest minute.

A.2 - User Call Summary

For each user in the first group of selected users
Switch
Originate:

Find all records with Accept Time and End Time in selected time range in which
Caller Name matches selected name, caller is originator, and Callee Name is in the second group of selected users, or
Callee Name matches selected name, callee is originator, and Caller Name is in the second group of selected users.
Receive:
Find all records with Accept Time and End Time in selected time range in which
Caller Name matches selected name, caller is receiver, and Callee Name is in the second group of selected users, or
Callee Name matches selected name, callee is receiver, and Caller Name is in the second group of selected users.
Originate and Receive:
Find all records with Accept Time and End Time in selected time range in which
Caller Name matches selected name and Callee Name is in the second group of selected users, or
Callee Name matches selected name and Caller Name is in the second group of selected users.
Create Service_List containing fields for Service (Media Server, Conference Center, Presentation, Broadcast, Device) and for each call class, Total and Minutes
For each Call Record
If callee is an Actual User and caller is an Actual User, then
List by user and call class, rounding class and user totals to nearest minute.
Else
Update Service_List by Call Service and call class Total and Minutes
For each entry in Service_List
List by call service and call class, rounding class and user totals to nearest minute.

A.3 - User Call Detail

For each selected user
Switch
Originate:
Find all records with Accept Time and End Time in selected time range in which
Caller Name matches selected name and caller is originator, or
Callee Name matches selected name and callee is originator.

Receive:

Find all records with Accept Time and End Time in selected time range in which

Caller Name matches selected name and caller is receiver, or

Callee Name matches selected name and callee is receiver.

Originate and Receive:

Find all records with Accept Time and End Time in selected time range in which Caller Name matches selected name or Callee Name matches selected name.

For each Call Record found

If Caller Service or Callee Service is Conference Center then

Find Participant record with same Call ID

Find all Participant Records with same Conf Session ID as this Participant Records

Create new ordered list Action_List of Action Records (like Participant Record with two new field called Action Time and Action Type)

Insert each Participant Record into Action_List twice using the following process

For each Participant Record

If Slot Number is –1, then ignore

Insert in ascending order by comparing Accept Time to Action Time, set Action Time to Accept Time and Action Type to Join

For each Participant Record

If Slot Number is –1, then ignore

Insert in ascending order by comparing End Time to Action Time, set Action Time to End Time and Action Type to Leave

Set Active_Participant_List initially NULL

Set Previous_Action_Time to NULL

Loop through Action_List

If selected name is in Active_Participant_List, then

List call with originator column containing selected name, participants column containing Active_Participant_List, Start Time column containing Previous_Action_Time, Duration column containing difference between Action Time and Previous_Action_Time

If Action Type is Join, then

Add Participant Name to Active_Participant_List

Else if Action Type is Leave, then

If Call Record CallID is Participant CallID, then

List call with originator column containing selected name, participants column containing Active_Participant_List, Start Time column containing Action Time, Duration column containing difference between Action Time and Previous_Action_Time

Remove Participant Name from Active_Participant_List

Exit Loop through Action List

Set Previous_Action_Time to Action Time

Else

If call is to a service

List call by originator and service name

Else

List call by originator and recipient

A.4 - User Call Total by Time Period

For each selected user

Switch

Originate:

Find all records with Accept Time and End Time in selected time range in which

Caller Name matches selected name and caller is originator, or

Callee Name matches selected name and callee is originator.

Receive:

Find all records with Accept Time and End Time in selected time range in which

Caller Name matches selected name and caller is receiver, or

Callee Name matches selected name and callee is receiver.

Originate and Receive:

Find all records with Accept Time and End Time in selected time range in which Caller Name matches selected name or Callee Name matches selected name.

List by selected time period and call class, rounding class and time period totals to nearest minute.

A.5 - Network Availability

For each selected switch

Find all Call Records and Hop Records with Server Name equal to the switch and Accept Time and End Time in selected time range

For all Call Records

Determine completion status

Increment call count by completion status

List by call completion status

A.6 - System Usage Between Switches

For each selected switch

Find all Call Records with Server Name equal to selected switch and Accept Time and End Time in selected time range

Create list of destination switches Destination_List containing fields for Server Name, Server Location, and for each LAN, WAN:Dedicated, WAN:Dial calls, Total, fields for number of calls and minutes

For each Call Record

If call is not LAN call, then

Determine call class and update destination switch (Server Name of last Hop Record) entry on Destination_List

For each entry in Destination_List

List information by call class, rounding times to nearest minute

A.7 - Trunk Busy

For each selected switch

Find all Call Records and Hop Records with Server Name or Next Hop Server equal to selected switch and Accept Time and End Time in selected time range

Create list of destination switches Destination_List containing fields for Server Name, Server Location, and Busy Count for each of 24 hours, initially all 0

For each Call Record and Hop Record

Determine Call Record or Hop Record busy status

If Server Name is selected switch and busy status is local, then increment Busy Count for hour of Start Time for the Server Name of call

If Next Hop Server is selected switch and busy status is remote, then increment Busy Count for hour of Start Time for the Next Hop Server of call

For each entry in Destination_List

List information by Server Name, Server Location, Busy Count per hour

A.8 - Conference Center Usage

For each selected switch

Find all Conference Records with Server Name equal to selected switch and Accept Time and End Time in selected time range

Create list of conference usage Conference_List containing fields for Server Name, Server Location, and Total Count and Total Minutes

For each Conference Record

Update entry on Destination_List

For each entry in Destination_List

List information by Server Name, Server Location, Total Count, Total Minutes (rounded to nearest minute)

A.9 - Conference Center Busy

For each selected switch

Find all Conference Records with Server Name equal to selected switch and Accept Time and End Time in selected time range

Create list of conference usage Conference_List containing fields for Server Name, Server Location, and Busy Count for each of 24 hours, initially all 0

For each Conference Record

If Conference End Event is "All busy", then increment count for hour of Start Time for the Server Name of call

For each entry in Destination_List

List information by Server Name, Server Location, Busy Count per hour

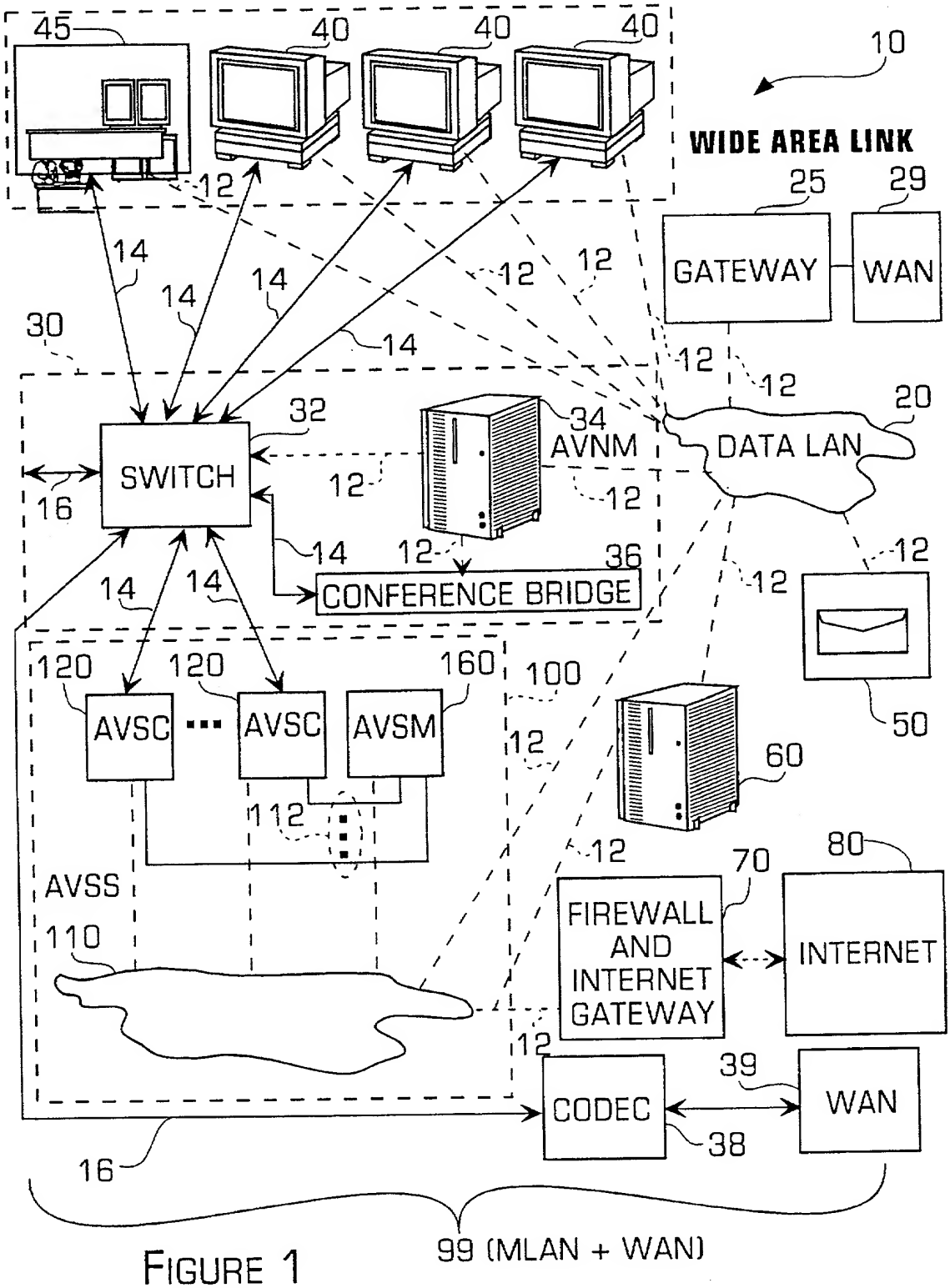

FIGURE 1
PRIOR ART

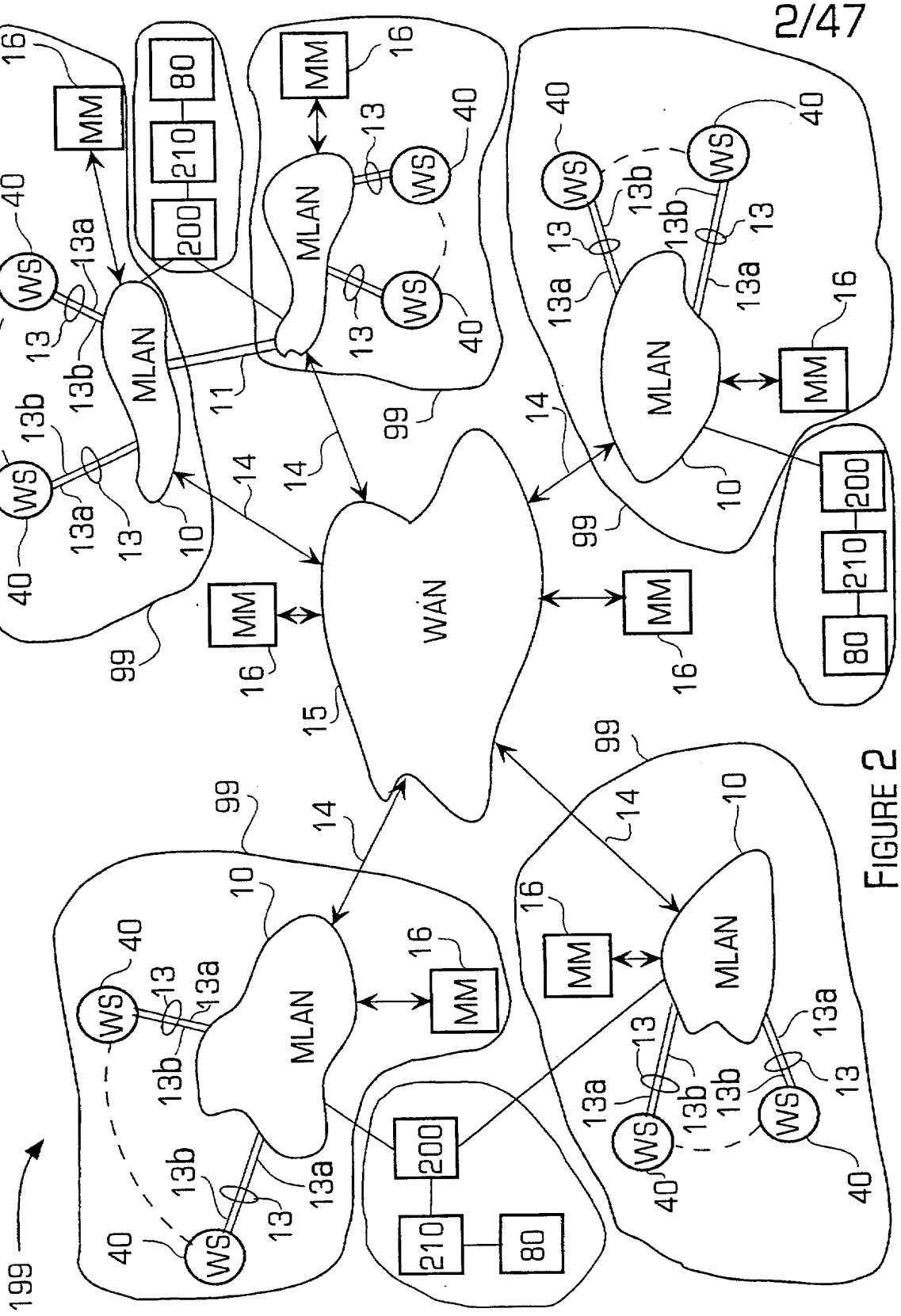

FIGURE 2

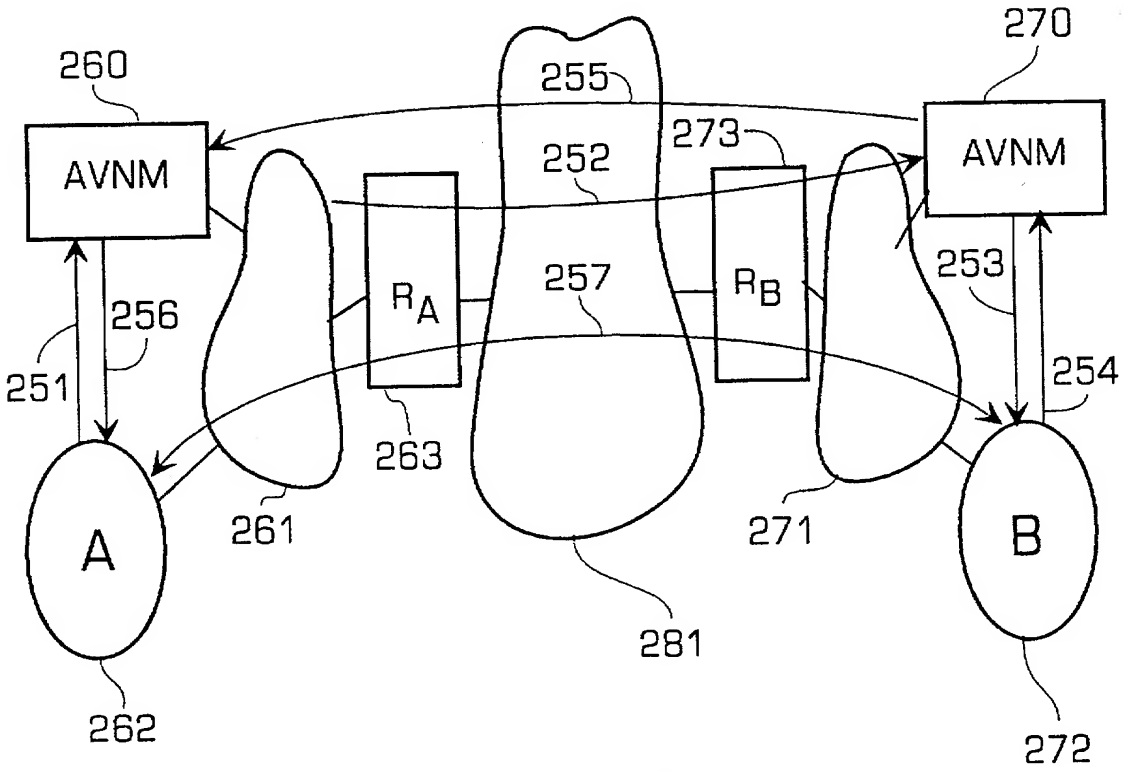

FIGURE 3

Substitute Sheet (Rule 26)

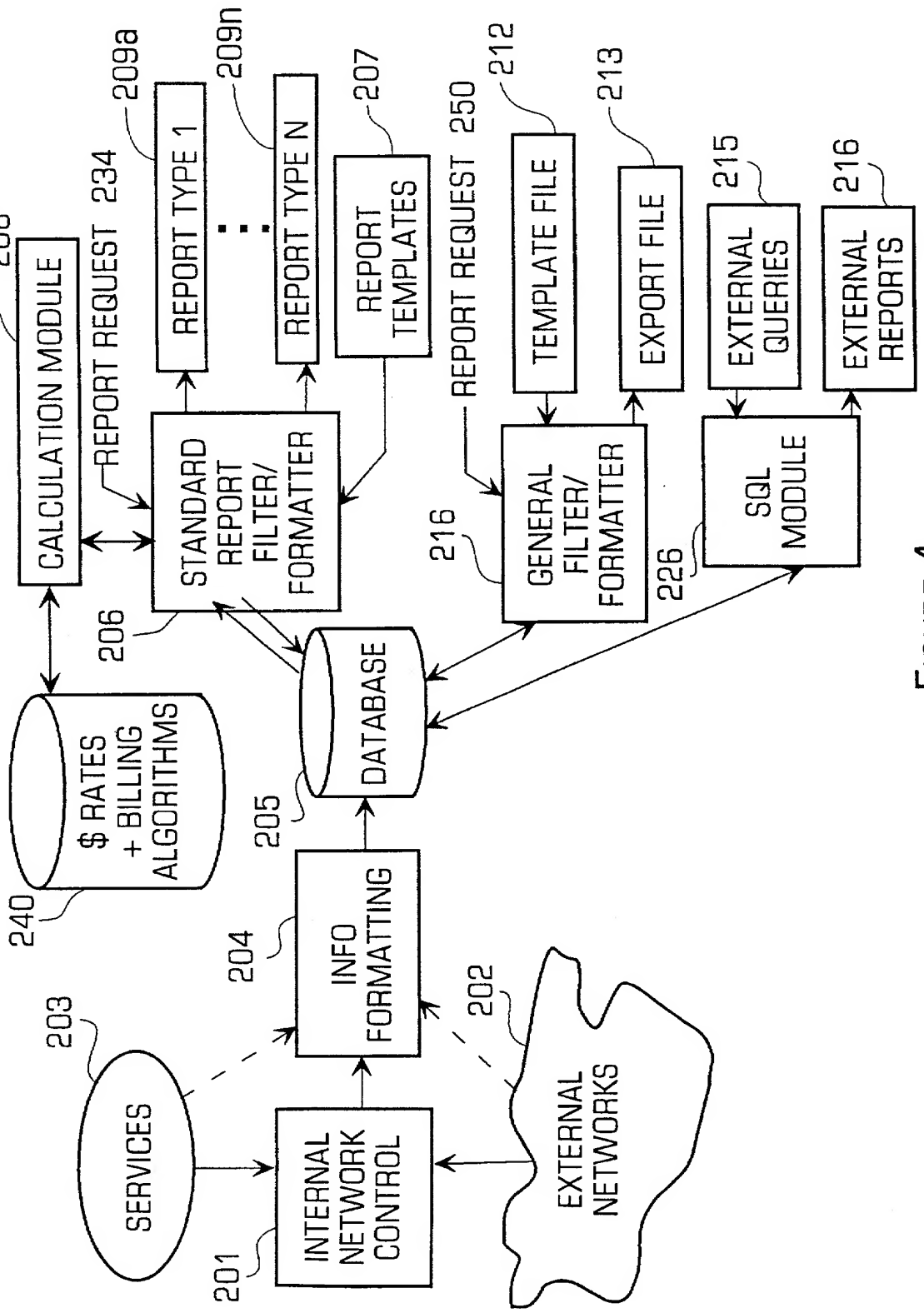
SERVICES
203
INTERNAL NETWORK CONTROL
201
EXTERNAL NETWORKS
202
INFO FORMATTING
204
DATABASE
205
$ RATES + BILLING ALGORITHMS
240
CALCULATION MODULE
208
REPORT REQUEST 234
STANDARD REPORT FILTER/ FORMATTER
206
REPORT TYPE 1
209a
REPORT TYPE N
209n
REPORT TEMPLATES
207
REPORT REQUEST 250
GENERAL FILTER/ FORMATTER
216
TEMPLATE FILE
212
EXPORT FILE
213
SQL MODULE
226
EXTERNAL QUERIES
215
EXTERNAL REPORTS
216

FIGURE 4

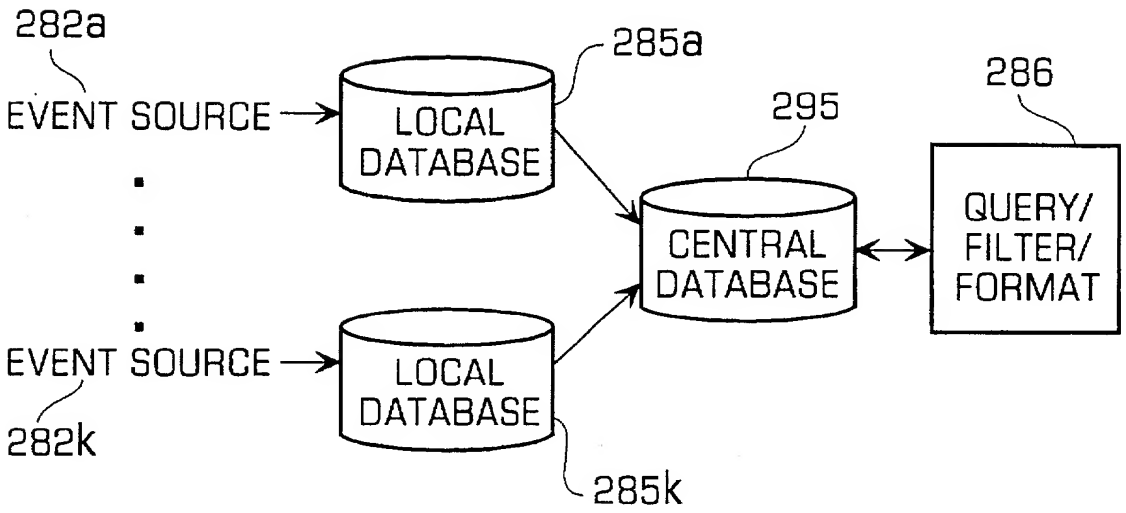

FIGURE 5A

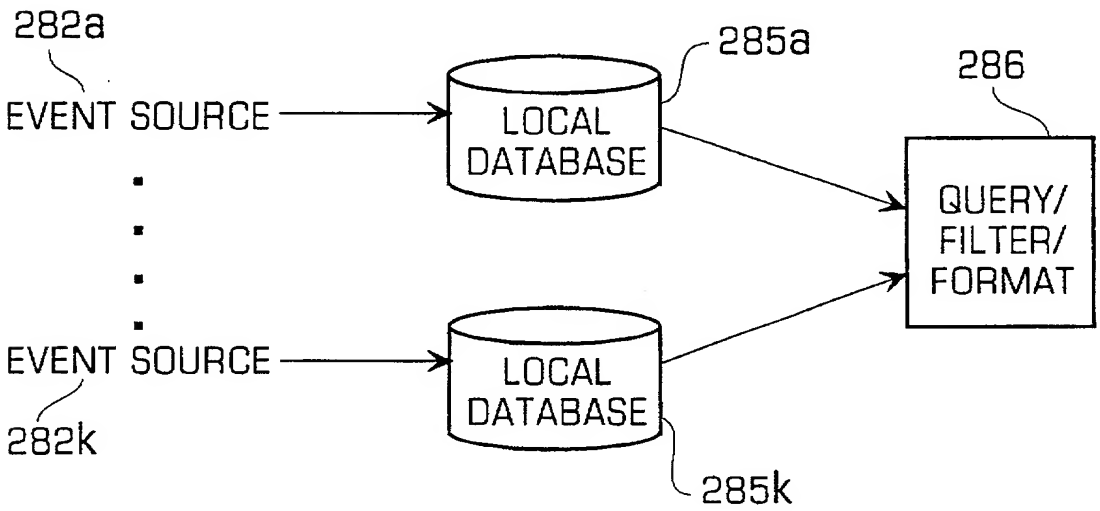

FIGURE 5B

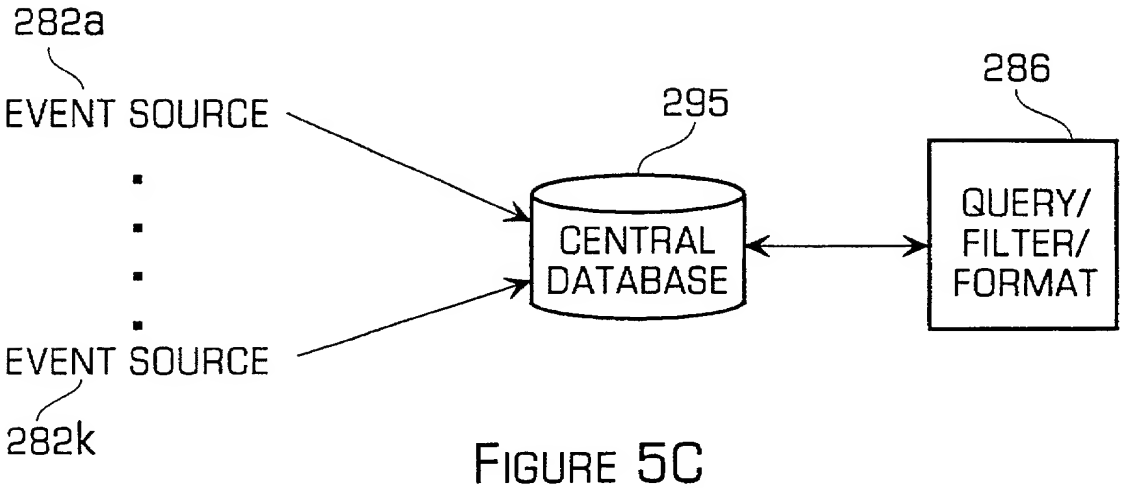

FIGURE 5C

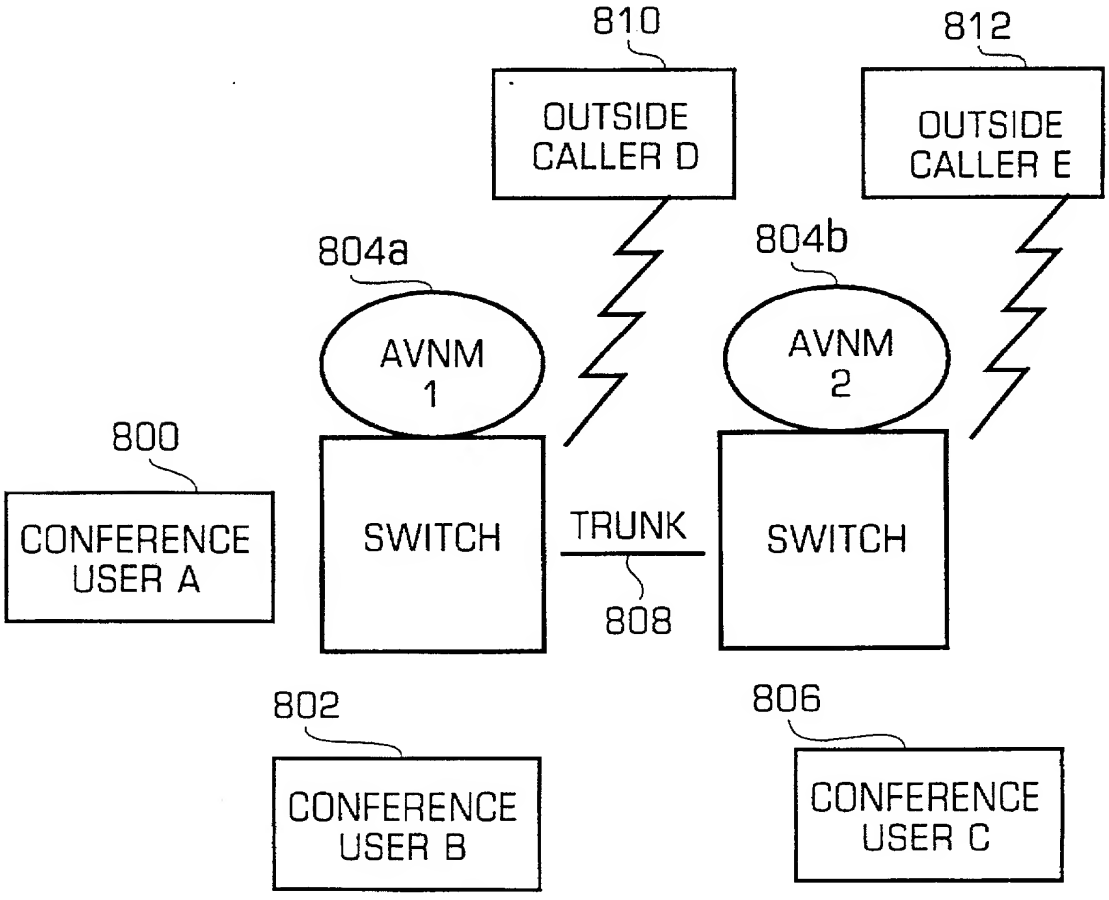

FIGURE 8

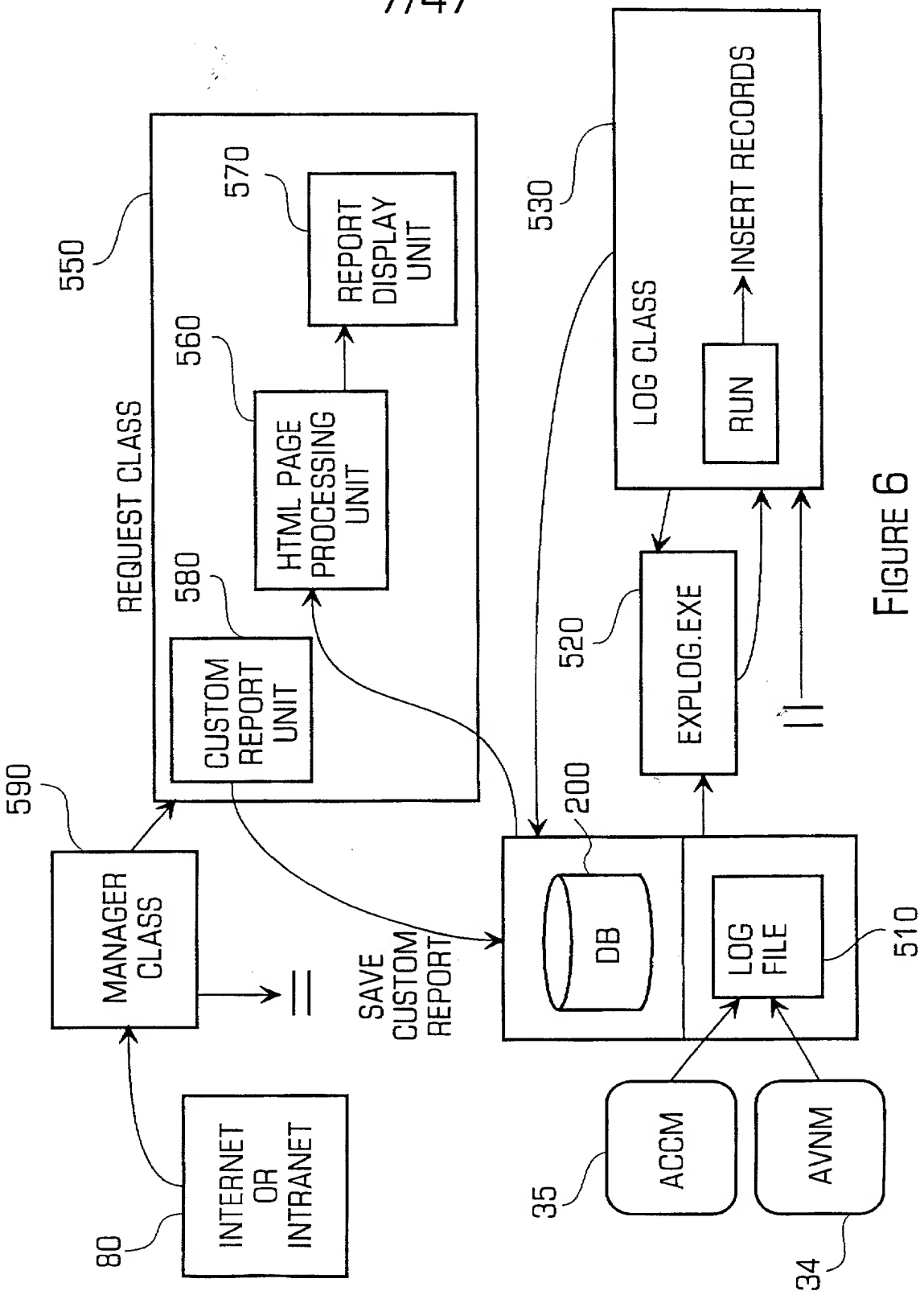
550
REQUEST CLASS
570
REPORT DISPLAY UNIT
560
HTML PAGE PROCESSING UNIT
580
CUSTOM REPORT UNIT
590
MANAGER CLASS
SAVE CUSTOM REPORT
200
DB
LOG FILE
510
530
LOG CLASS
INSERT RECORDS
RUN
520
EXPLOG.EXE
80
INTERNET OR INTRANET
35
ACCM
34
AVNM

FIGURE 6

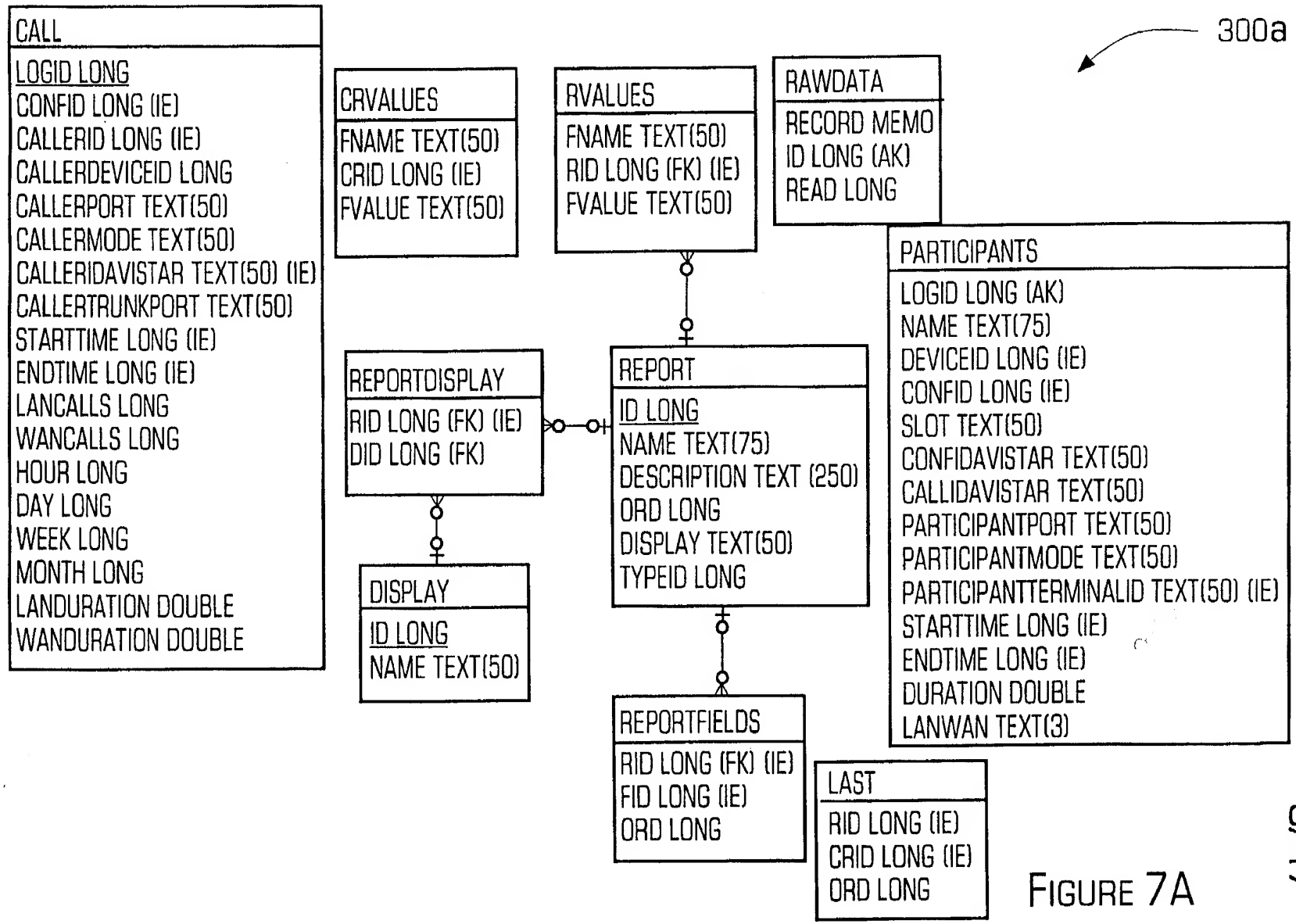
300a
CALL
LOGID LONG
CONFID LONG (IE)
CALLERID LONG (IE)
CALLERDEVICEID LONG
CALLERPORT TEXT(50)
CALLERMODE TEXT(50)
CALLERIDAVISTAR TEXT(50) (IE)
CALLERTRUNKPORT TEXT(50)
STARTTIME LONG (IE)
ENDTIME LONG (IE)
LANCALLS LONG
WANCALLS LONG
HOUR LONG
DAY LONG
WEEK LONG
MONTH LONG
LANDURATION DOUBLE
WANDURATION DOUBLE
CRVALUES
FNAME TEXT(50)
CRID LONG (IE)
FVALUE TEXT(50)
RVALUES
FNAME TEXT(50)
RID LONG (FK) (IE)
FVALUE TEXT(50)
RAWDATA
RECORD MEMO
ID LONG (AK)
READ LONG
PARTICIPANTS
LOGID LONG (AK)
NAME TEXT(75)
DEVICEID LONG (IE)
CONFID LONG (IE)
SLOT TEXT(50)
CONFIDAVISTAR TEXT(50)
CALLIDAVISTAR TEXT(50)
PARTICIPANTPORT TEXT(50)
PARTICIPANTMODE TEXT(50)
PARTICIPANTTERMINALID TEXT(50) (IE)
STARTTIME LONG (IE)
ENDTIME LONG (IE)
DURATION DOUBLE
LANWAN TEXT(3)
REPORTDISPLAY
RID LONG (FK) (IE)
DID LONG (FK)
REPORT
ID LONG
NAME TEXT(75)
DESCRIPTION TEXT (250)
ORD LONG
DISPLAY TEXT(50)
TYPEID LONG
DISPLAY
ID LONG
NAME TEXT(50)
REPORTFIELDS
RID LONG (FK) (IE)
FID LONG (IE)
ORD LONG
LAST
RID LONG (IE)
CRID LONG (IE)
ORD LONG

FIGURE 7A

20402 Patent

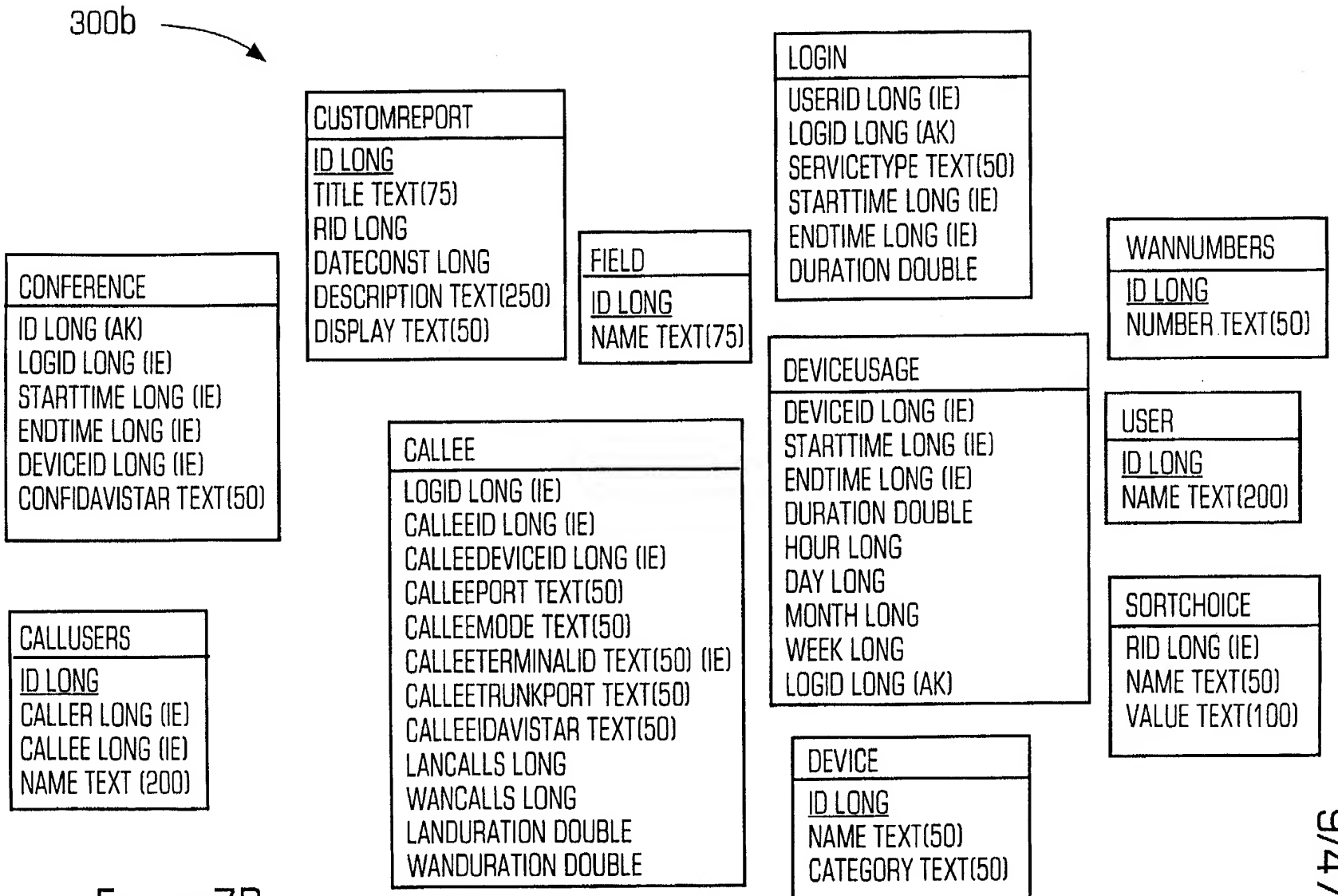

FIGURE 7B

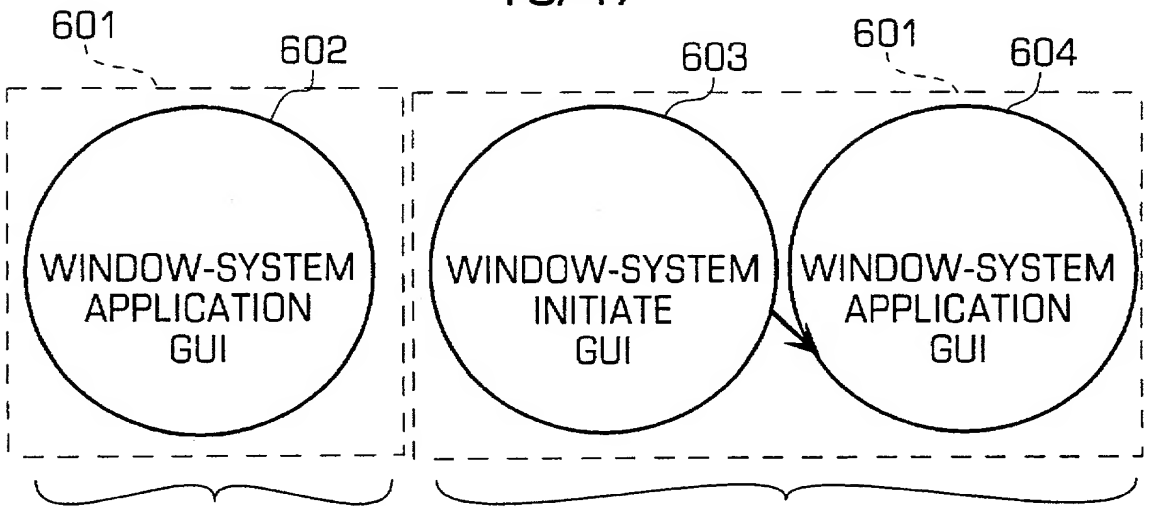

FIGURE 9A1 FIGURE 9A2

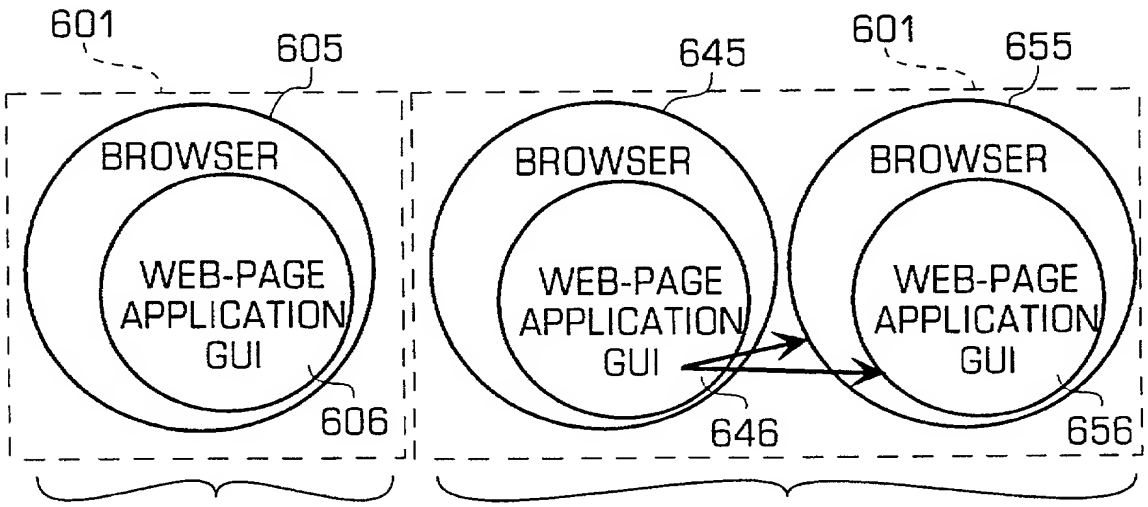

FIGURE 9C1 FIGURE 9C2

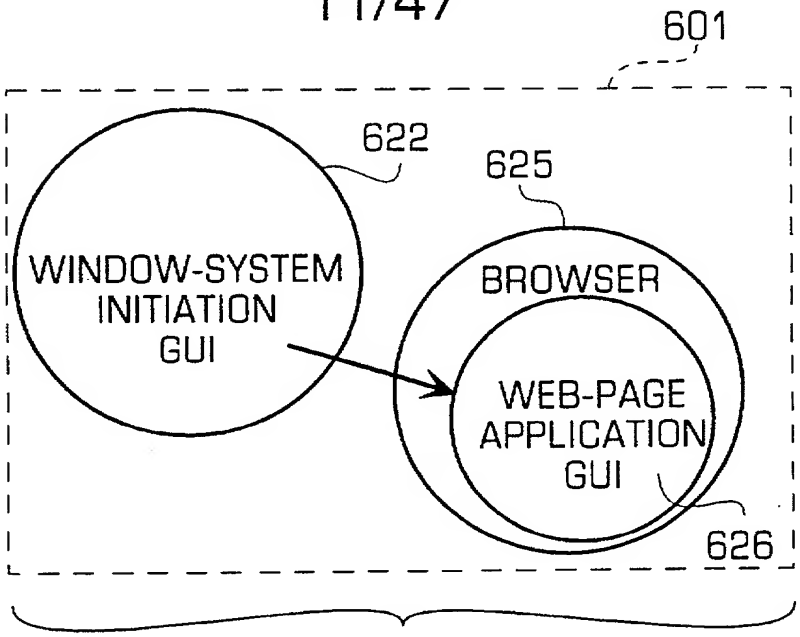

FIGURE 9B1

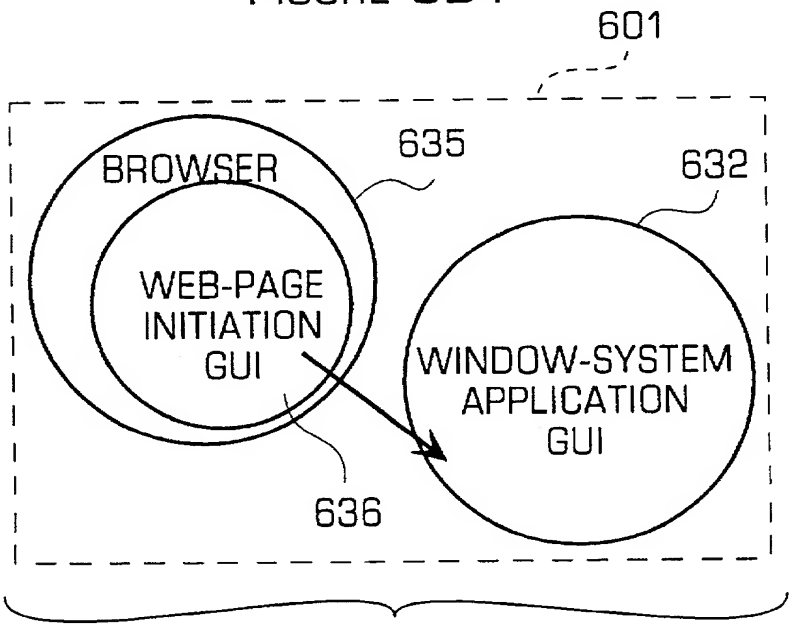

FIGURE 9B2

Data Management — **Import**

Import | **Delete**

CURRENT DATE RANGE OF IMPORTED DATA: 04/13/1999 3:33 PM TO 05/11/1999 2:29 PM

MANUAL IMPORT:

1001

PLEASE CHOOSE AN IMPORT METHOD:

(•) MOST RECENT LOG RECORDS (RECORDS CREATED AFTER 05/11/1999 2:29 PM)

( ) TIME RANGE: 1998 ▾ JAN ▾ 01 ▾ TO 1998 ▾ JAN ▾ 01 ▾

12 ▾ : 00 ▾ AM ▾ 12 ▾ : 00 ▾ AM ▾

NOTE: EXISTING RECORDS DURING A SPECIFIED TIME RANGE WILL BE DELETED BEFORE IMPORTING

IMPORT RECORDS

AUTOMATIC IMPORT SETTINGS:

[ ] AUTOMATICALLY IMPORT DAILY AT 11 PM ▾

SAVE NEW SETTINGS

1000

FIGURE 10

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018441

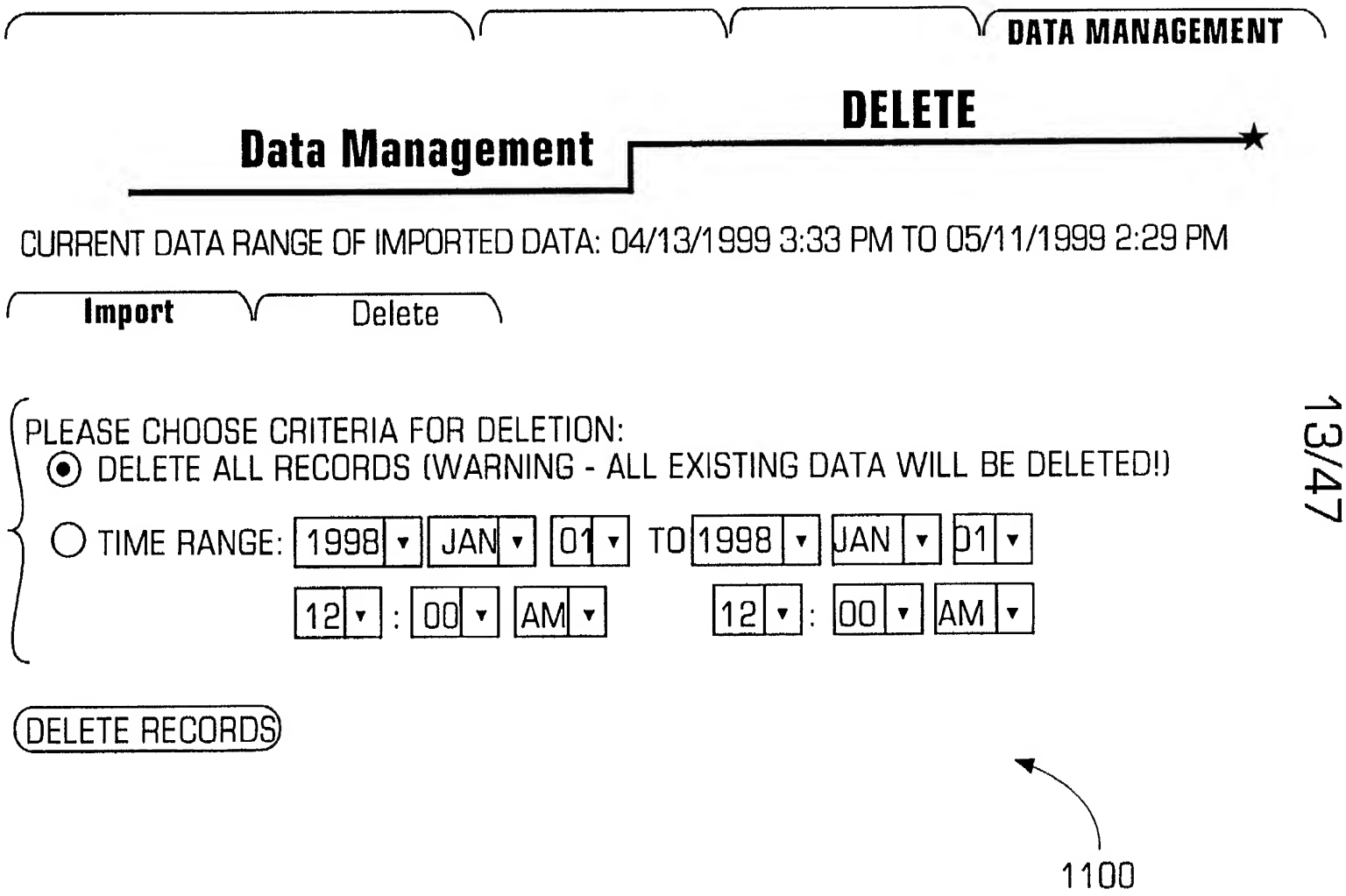
DATA MANAGEMENT
Data Management
DELETE
CURRENT DATA RANGE OF IMPORTED DATA: 04/13/1999 3:33 PM TO 05/11/1999 2:29 PM
Import
Delete
PLEASE CHOOSE CRITERIA FOR DELETION:
DELETE ALL RECORDS (WARNING - ALL EXISTING DATA WILL BE DELETED!)
TIME RANGE: 1998 JAN 01 TO 1998 JAN 01
12 : 00 AM 12 : 00 AM
1101
DELETE RECORDS
1100

FIGURE 11

Standard Reports

User Activity

Calls Between Users
Detailed account of calls made between a user or group of users, and another user or group of users.

User Call Detail
Detailed account of the calls made to (originate), from (receive), or to and from (originate and receive) a user or group of users.

Number of Calls Completed by User
Tabulates number of calls originated and/or received by users in a time period with breakdown of LAN and WAN calls.

Number of Calls Completed by Time Period
Tabulates number of calls originated and/or received by users in time periods over a specified time range with breakdown of LAN and WAN calls.

Call Duration
Tabulates cumulative minutes of use for LAN and WAN calls originated and/or received by specified users during a time period.

Resource Usage

Total Device Usage by number of Calls
Total number of inbound and outbound calls for a list of devices over a time range.

Total Device Usage by Duration
Cumulative minutes of use (inbound and outbound) for a list of devices over a time range.

Total Device Usage by Time Period
Cumulative minutes of use (inbound and outbound) for a list of devices in each time period over a range of time.

1200

FIGURE 12

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018441

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018441

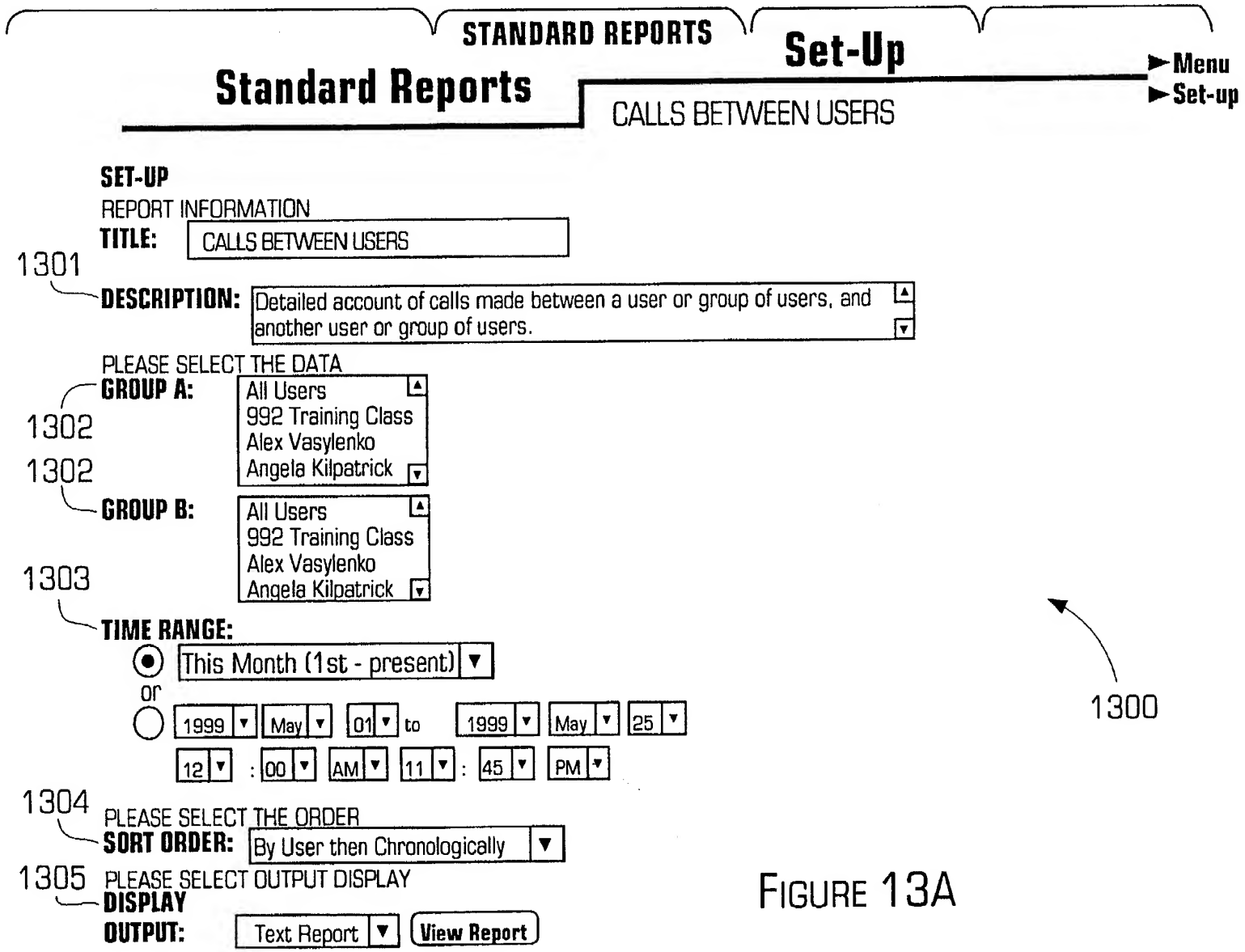

FIGURE 13A

1350 →

FIGURE 13B

REPORT TITLE: Calls Between Users

REPORT DESCRIPTION: Detailed account of calls made between a user or group of users, and another user or group of users.

TYPE OF CALL: N/A

TIME RANGE: 05/01/1999 12:00 AM - 05/31/1999 11:59 PM

SORT ORDER: By User then Chronologically

Number of Call Records Found: 37 (Displaying 1-37)
Total Call Minutes: 0:23:31

CALL ORIGINATOR	LAN CALL RECIPIENT(S)	WAN CALL Recipient(s)	START TIME	DURATION
ANGELA KILPATRICK	HEATHER DAVIS-RECEPTIONIST		05/03/1999 7:35 AM	0:00:14
ANGELA KILPATRICK	HEATHER DAVIS-RECEPTIONIST, ERIC WOOD		05/03/1999 7:35 AM	0:00:23
ANGELA KILPATRICK	HEATHER DAVIS-RECEPTIONIST		05/03/1999 8:24 AM	0:00:29
ANGELA KILPATRICK	HEATHER DAVIS-RECEPTIONIST		05/03/1999 2:07 PM	0:00:41
ANGELA KILPATRICK	HEATHER DAVIS-RECEPTIONIST		05/03/1999 2:20 PM	0:00:17
ANGELA KILPATRICK	HEATHER DAVIS-RECEPTIONIST		05/03/1999 2:21 PM	0:01:13
ANGELA KILPATRICK	HEATHER DAVIS-RECEPTIONIST		05/04/1999 8:43 AM	0:00:31
ANGELA KILPATRICK	HEATHER DAVIS-RECEPTIONIST		05/04/1999 12:42 PM	0:00:18
ANGELA KILPATRICK	HEATHER DAVIS-RECEPTIONIST		05/04/1999 2:21 PM	0:00:48
ANGELA KILPATRICK	HEATHER DAVIS-RECEPTIONIST		05/05/1999 8:43 AM	0:00:05
ANGELA KILPATRICK	HEATHER DAVIS-RECEPTIONIST, ERIC HORSCHMAN		05/05/1999 9:07 AM	0:01:18
ANGELA KILPATRICK	HEATHER DAVIS-RECEPTIONIST		05/06/1999 8:13 AM	0:00:26
ANGELA KILPATRICK	HEATHER DAVIS-RECEPTIONIST		05/07/1999 8:00 AM	0:01:00
ANGELA KILPATRICK	HEATHER DAVIS-RECEPTIONIST		05/07/1999 11:13 AM	0:00:14
ANGELA KILPATRICK	CHRIS LAUWERS		05/07/1999 11:29 AM	0:00:07
ANGELA KILPATRICK	MIKE DAINKO		05/10/1999 11:25 AM	0:00:04
ANGELA KILPATRICK	HEATHER DAVIS-RECEPTIONIST		05/11/1999 8:22 AM	0:01:18
HEATHER DAVIS-RECEPTIONIST	ELLIE WIERENGA, ANGELA KILPATRICK		05/03/1999 7:33 AM	0:02:04
HEATHER DAVIS-RECEPTIONIST	ANGELA KILPATRICK		05/03/1999 8:46 AM	0:00:37
HEATHER DAVIS-RECEPTIONIST	ANGELA KILPATRICK		05/05/1999 10:05 AM	0:00:11

MIKE DAINKO	ANGELA KILPATRICK		05/10/1999 11:29 AM	0:00:43
DIANN CUPPLES		HEATHER DAVIS-RECEPTIONIST	05/10/1999 9:17 AM	0:00:38
CHRIS LAUWERS		DIANN CUPPLES	05/04/1999 12:47 AM	0:03:49
HEATHER DAVIS-RECEPTIONIST		DIANN CUPPLES	05/11/1999 8:48 AM	0:01:36
TAMMY FRESCA	CHRIS LAUWERS		05/05/1999 11:33 AM	0:00:04
TAMMY FRESCA	CHRIS LAUWERS		05/051999 11:34 AM	0:00:07
TAMMY FRESCA	CHRIS LAUWERS		05/05/1999 11:40 AM	0:00:02
TAMMY FRESCA	CHRIS LAUWERS		05/06/1999 7:26 AM	0:00:03
TAMMY FRESCA	LAN RUPF, CHRIS LAUWERS	DEBBIE ROSENKOETTER	05/06/1999 7:34 AM	0:02:21
TAMMY FRESCA	CHRIS LAUWERS		05/06/1999 7:36 AM	0:00:08
TAMMY FRESCA	CHRIS LAUWERS		05/06/1999 7:39 AM	0:00:28
TAMMY FRESCA	CHRIS LAUWERS		05/10/1999 12:44 PM	0:00:12
CHRIS LAUWERS	TAMMY FRESCA		05/03/1999 2:28 PM	0:00:29
CHRIS LAUWERS	TAMMY FRESCA		05/05/1999 12:29 PM	0:00:03
CHRIS LAUWERS	TAMMY FRESCA		05/06/1999 7:38 AM	0:00:02
CHRIS LAUWERS	TAMMY FRESCA		05/06/1999 12:35 PM	0:00:16
HEATHER DAVIS-RECEPTIONIST	TAMMY FRESCA		05/10/1999 8:52 AM	0:00:12
TOTAL LAN MINUTES: 0:23:34 **TOTAL WAN MINUTES:** 0:08:24				

1350

FIGURE 13C

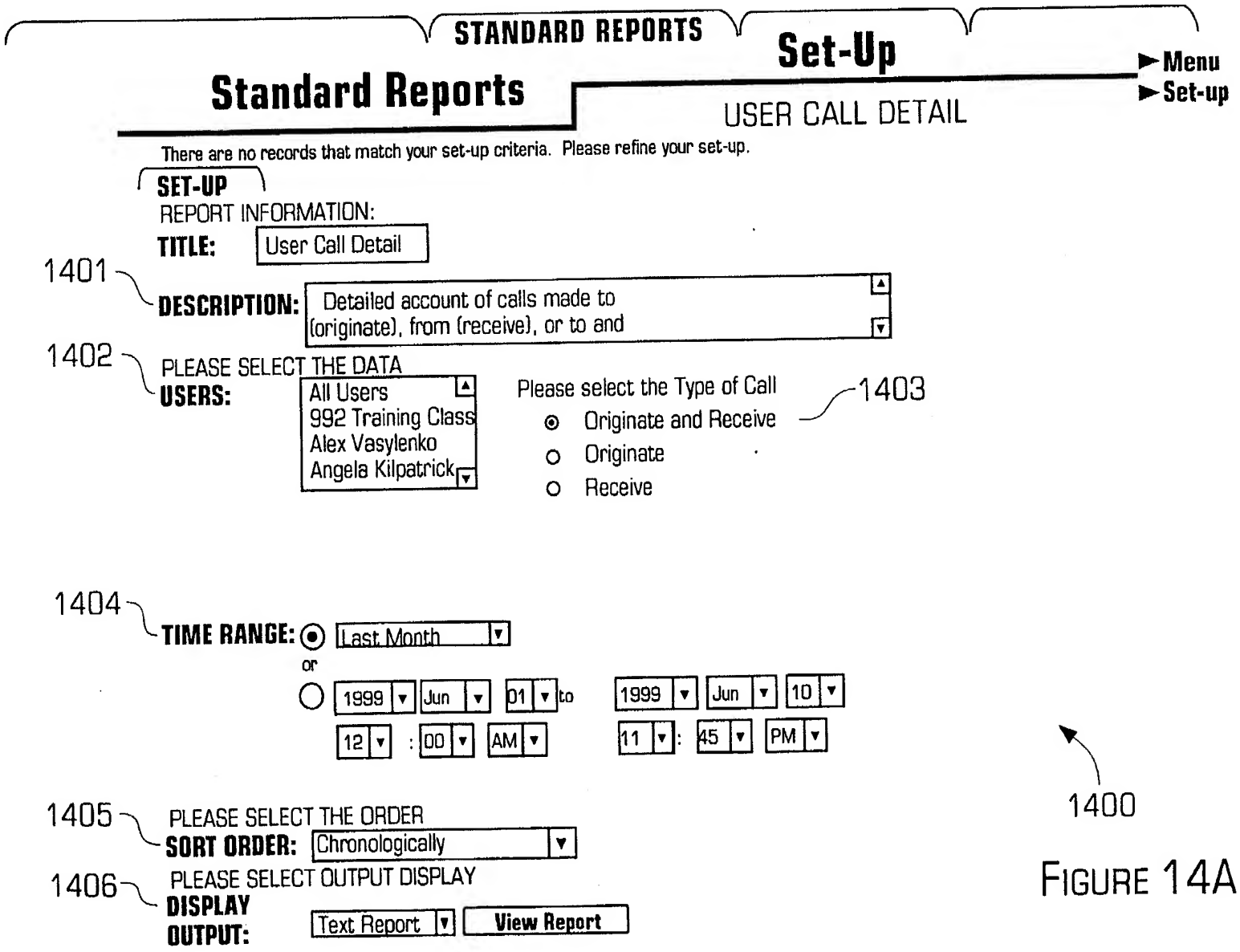

FIGURE 14A

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018441

1450 →

FIGURE 14B

REPORT TITLE: User Call Detail

REPORT DESCRIPTION: Detailed account of calls made to (originate), from (receive), or to and from (originate and receive) a user or group of users.

TYPE OF CALL: Originate and Receive

TIME RANGE: 05/01/1999 12:00 AM - 05/31/1999 11:59 PM

SORT ORDER: Chronologically

Number of Call Records Found: 68 (Displaying 1-68)
Total Call Minutes: 2:21:55

CALL ORIGINATOR	LAN CALL RECIPIENT(S)	WAN CALL Recipient(s)	START TIME	DURATION
MIKE DAINKO	CNN_PALO_ALTO		05/10/1999 7:07 AM	0:01:29
PAUL GAMBERDELLA	TAMMY FRESCA, MIKE DAINKO	OUTSIDE CALL, OUTSIDE CALL	05/10/1999 7:11 AM	0:13:54
MIKE DAINKO		JOSH ROSENBLUM	05/10/1999 7:25 AM	0:00:10
MIKE DAINKO		JOSH ROSENBLUM	05/10/1999 7:25 AM	0:00:17
MIKE DAINKO		MATT BASHAM	05/10/1999 7:26 AM	0:02:16
MIKE DAINKO		OUTSIDE CALL	05/10/1999 7:34 AM	0:02:03
MIKE DAINKO		DEBBIE ROSENKOETTER	05/10/1999 7:38 AM	0:20:00
MIKE DAINKO		DEBBIE ROSENKOETTER	05/10/1999 7:58 AM	0:11:20
DEBBIE ROSENKOETTER		MIKE DAINKO	05/10/1999 8:09 AM	0:00:02
DEBBIE ROSENKOETTER		MIKE DAINKO	05/10/1999 8:09 AM	0:02:24
DEBBIE ROSENKOETTER		MIKE DAINKO	05/10/1999 8:12 AM	0:04:44
DEBBIE ROSENKOETTER		MIKE DAINKO	05/10/1999 8:23 AM	0:00:07
DEBBIE ROSENKOETTER		MIKE DAINKO	05/10/1999 8:23 AM	0:01:37
MIKE DAINKO		JOSH ROSENBLUM, DEBBIE ROSENKOETTER	05/10/1999 8:25 AM	0:01:21
MIKE DAINKO		DEBBIE ROSENKOETTER	05/10/1999 8:26 AM	0:01:27
MIKE DAINKO		DEBBIE ROSENKOETTER	05/10/1999 8:28 AM	0:00:19
DEBBIE ROSENKOETTER		MIKE DAINKO	05/10/1999 8:28 AM	0:00:08
DEBBIE ROSENKOETTER		MIKE DAINKO	05/10/1999 8:29 AM	0:00:08
DEBBIE ROSENKOETTER		MIKE DAINKO	05/10/1999 8:29 AM	0:01:01
MIKE DAINKO		DEBBIE ROSENKOETTER	05/10/1999 8:30 AM	0:02:44

FIGURE 14C

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Debbie Rosenkoetter		Mike Dainko	05/10/1999 8:33 AM	0:00:08
Debbie Rosenkoetter		Mike Dainko	05/10/1999 8:34 AM	0:01:33
Debbie Rosenkoetter		Mike Dainko	05/10/1999 8:36 AM	0:00:53
MikeDainko		Debbie Rosenkoetter	05/10/1999 8:37 AM	0:00:47
Debbie Rosenkoetter		Mike Dainko	05/10/1999 8:37 AM	0:00:08
Debbie Rosenkoetter		Mike Dainko	05/10/1999 8:38 AM	0:00:30
Debbie Rosenkoetter		Mike Dainko	05/10/1999 8:38 PM	0:00:01
MikeDainko		Outside Call	05/10/1999 8:39 AM	0:00:04
Debbie Rosenkoetter		Mike Dainko	05/10/1999 8:39 AM	0:00:31
Mike Dainko		Debbie Rosenkoetter	05/10/1999 8:40 AM	0:00:51
Mike Dainko		Ian O'Brien	05/10/1999 8:41 AM	0:07:07
Mike Dainko	Mike Dainko	Outside Call	05/10/1999 8:52AM	0:00:12
Brian Wood	Mike Dainko		05/10/1999 9:00 AM	0:00:41
Brian Wood	Mike Dainko		05/10/1999 9:03 AM	0:01:55
Brian Wood	Brian Wood	Outside Call	05/10/1999 9:05 AM	0:01:13
Mike Dainko	Mike Dainko		05/10/1999 9:10 AM	0:00:03
Brian Wood	Mike Dainko		05/10/1999 9:15 AM	0:00:06
Brian Wood			05/10/1999 9:26 AM	0:00:03
Mike Dainko	MikeDainko	Outside Call	05/10/1999 9:45 AM	0:00:13
Tanya Tran	MikeDainko		05/10/1999 9:57 AM	0:00:08
Brian Wood			05/10/1999 10:02 AM	0:00:03
Mike Dainko		Outside Call	05/10/1999 11:11 AM	0:00:49
Mike Dainko		Debbie Rosenkoetter	05/10/1999 11:12 AM	0:02:11
Mike Dainko	Mike Dainko	Outside Call	05/10/1999 11:22 AM	0:00:36
Angela Kilpatrick	Angela Kilpatrick		05/10/1999 11:25 AM	0:00:04
Mike Dainko	Steve Arisco		05/10/1999 11:29 AM	0:00:43
Mike Dainko			05/10/1999 11:30 AM	0:00:11

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Ian O'Brien		Mike Dainko	05/10/1999 11:31 AM	0:01:18
Mike Dainko		Outside Call	05/10/1999 11:33 AM	0:00:16
Mike Dainko	Pearl O'Brien		05/10/1999 11:33 AM	0:01:42
Mike Dainko	Pearl O'Brien		05/10/1999 11:37AM	0:02:17
Pearl O'Brien	Mike Dainko, Jean Dominquez	Outside Call	05/10/1999 11:39 AM	0:16:52
Mike Dainko		Outside Call	05/10/1999 11:43AM	0:00:13
Brian Wood	Mike Dainko		05/10/1999 12:05 PM	0:00:03
Mike Dainko		Outside Call	05/10/1999 4:13 PM	0:04:48
Mike Dainko		Outside Call, Outside Call	05/10/1999 4:18 PM	0:01:03
Mike Dainko		Outside Call	05/10/1999 4:19 PM	0:00:42
Mike Dainko		Outside Call	05/10/1999 4:20 PM	0:00:56
Mike Dainko		Outside Call	05/10/1999 4:22 PM	0:01:02
Mike Dainko		Outside Call	05/10/1999 4:25 PM	0:14:33
Mike Dainko	Chris Lauwers		05/10/1999 4:33 PM	0:00:08
Mike Dainko	Alex Vasylenko		05/10/1999 4:33 PM	0:00:11
Mike Dainko	Chris Lauwers		05/10/1999 4:33 PM	0:00:51
Outside Call	Mike Dainko		05/10/1999 4:41 PM	0:00:47
Mike Dainko		Outside Call	05/10/1999 4:47 PM	0:00:13
Mike Dainko		Outside Call	05/10/1999 4:48 PM	0:03:59
Mike Dainko		Outside Call	05/10/1999 4:52 PM	0:00:43
Mike Dainko	Steve Arisco		05/10/1999 4:53 PM	0:00:03
TOTAL LAN MINUTES: 1:31:05 **TOTAL WAN MINUTES:** 2:26:45				

FIGURE 14D

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018441

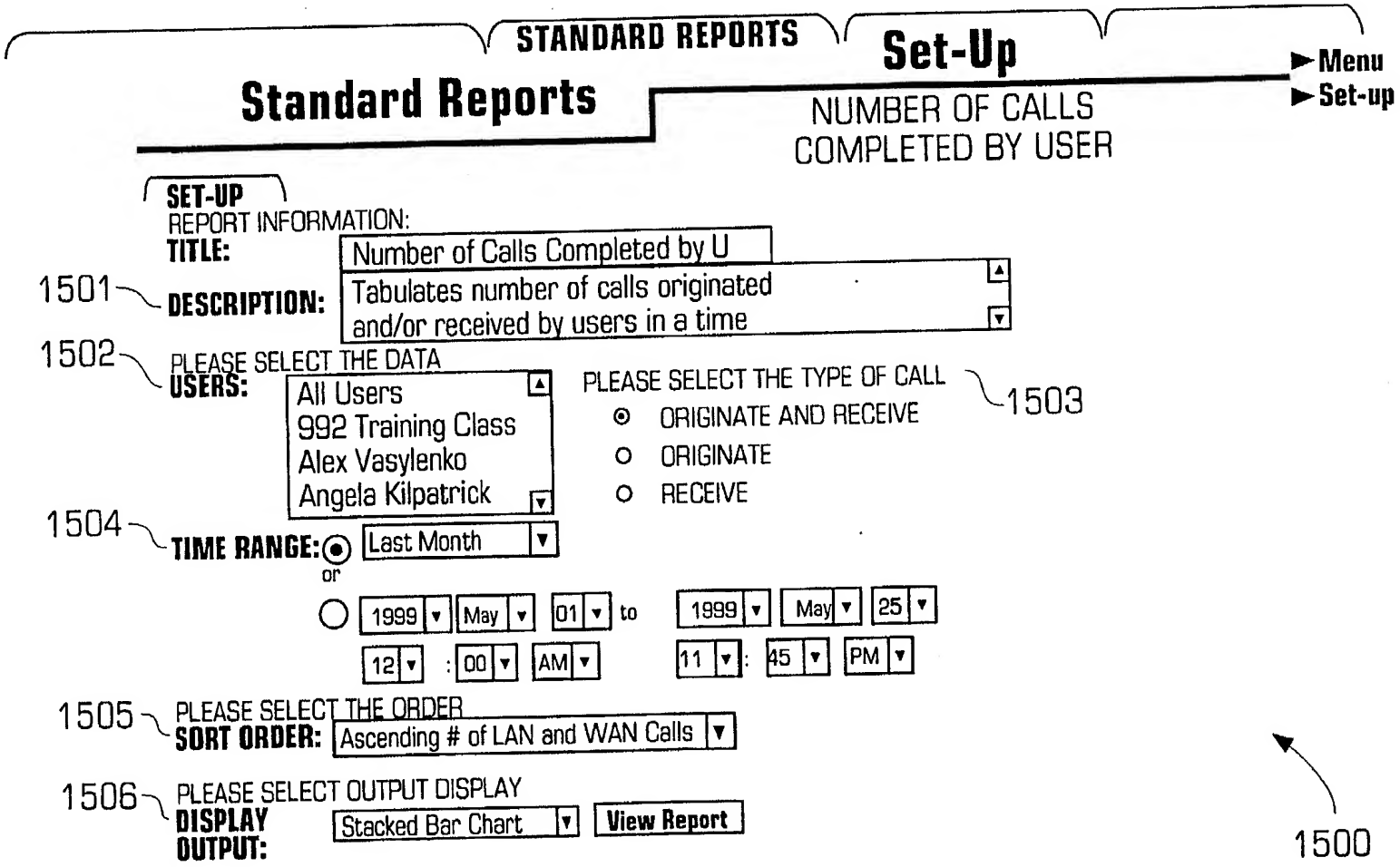


FIGURE 15A

STANDARD REPORTS

Standard Reports

View Report

Menu
Set-up

NUMBER OF CALLS COMPLETED BY USER

PRINT FORMAT

SAVE AS CUSTOM

MODIFY

REPORT TITLE: Number of Calls Completed by User

REPORT DESCRIPTION: Tabulates number of calls originated and/or received by users in a time period with breakdown of LAN and WAN calls

TYPE OF CALL: Originate and Receive

TIME RANGE: 04/01/1999 12:00 AM - 04/30/1999 11:59 PM

SORT ORDER: Ascending # of LAN Calls

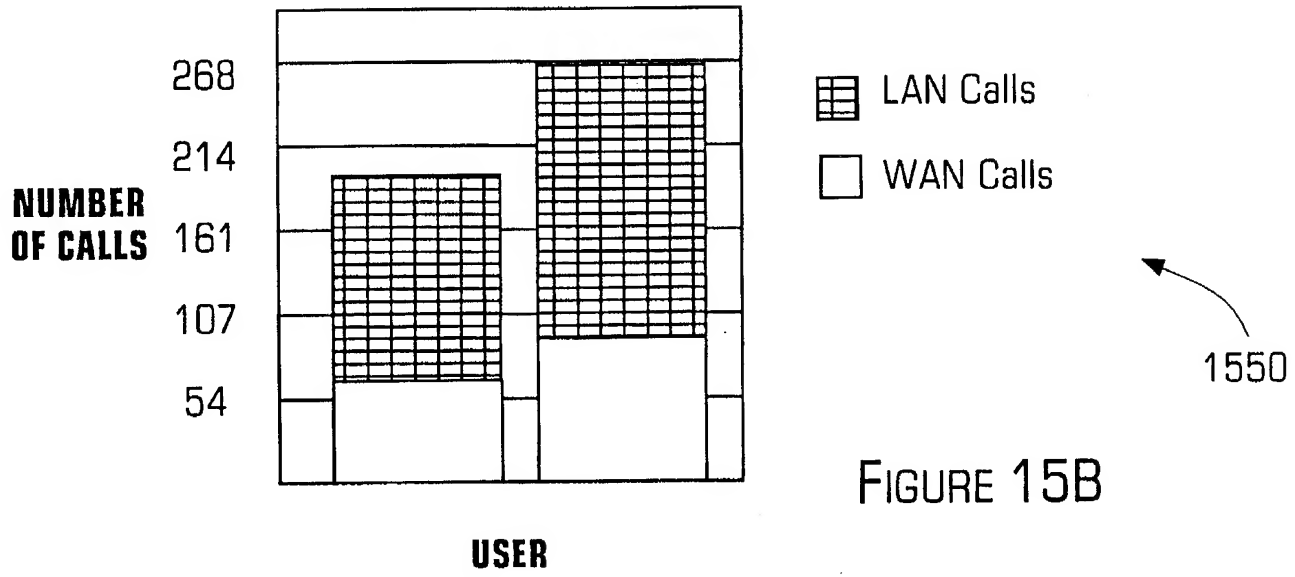


FIGURE 15B

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018441

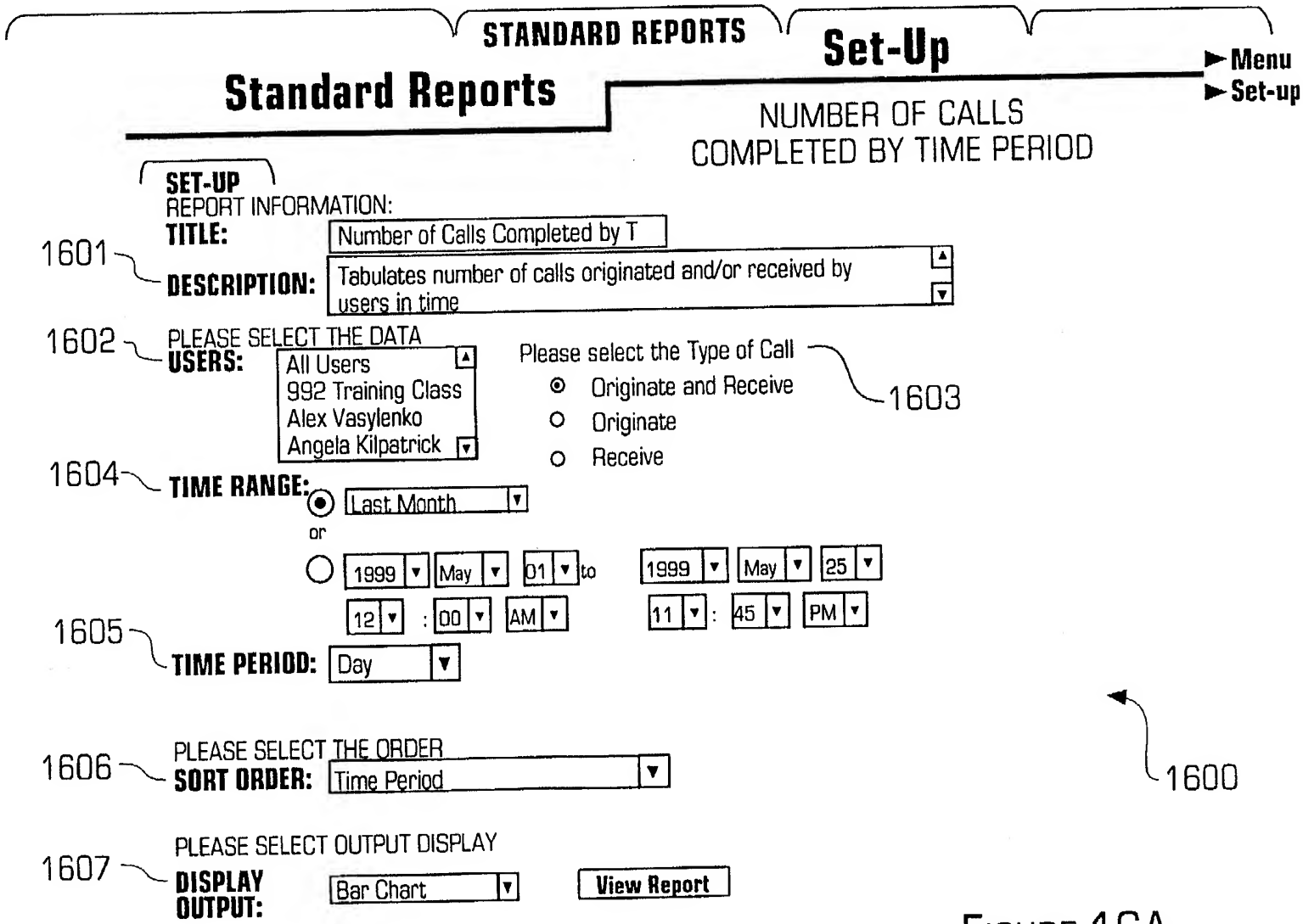


FIGURE 16A

Standard Reports

View Report

NUMBER OF CALLS
COMPLETED BY TIME PERIOD

PRINT FORMAT

SAVE AS CUSTOM

MODIFY

REPORT TITLE: Number of Calls Completed by Time Period

REPORT DESCRIPTION: Tabulates number of calls originated and/or received by users in time periods over a specified time range with breakdown of LAN and WAN calls.

TYPE OF CALL: Originate and Receive

TIME RANGE: 04/01/1999 12:00 AM - 04/30/1999 11:59 PM

SORT ORDER: Time Period

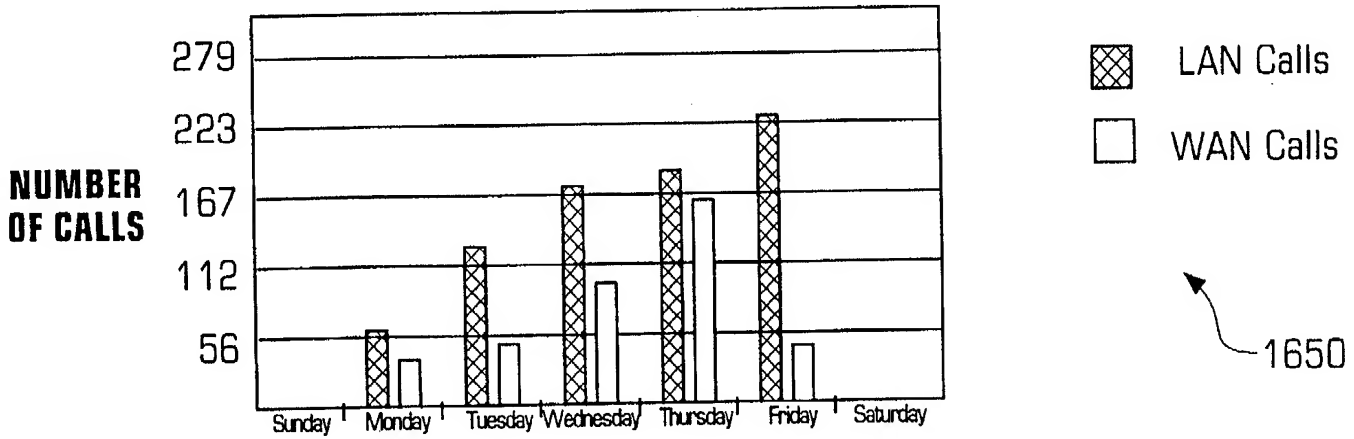


FIGURE 16B

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018441

SUBSTITUTE SHEET (RULE 26)

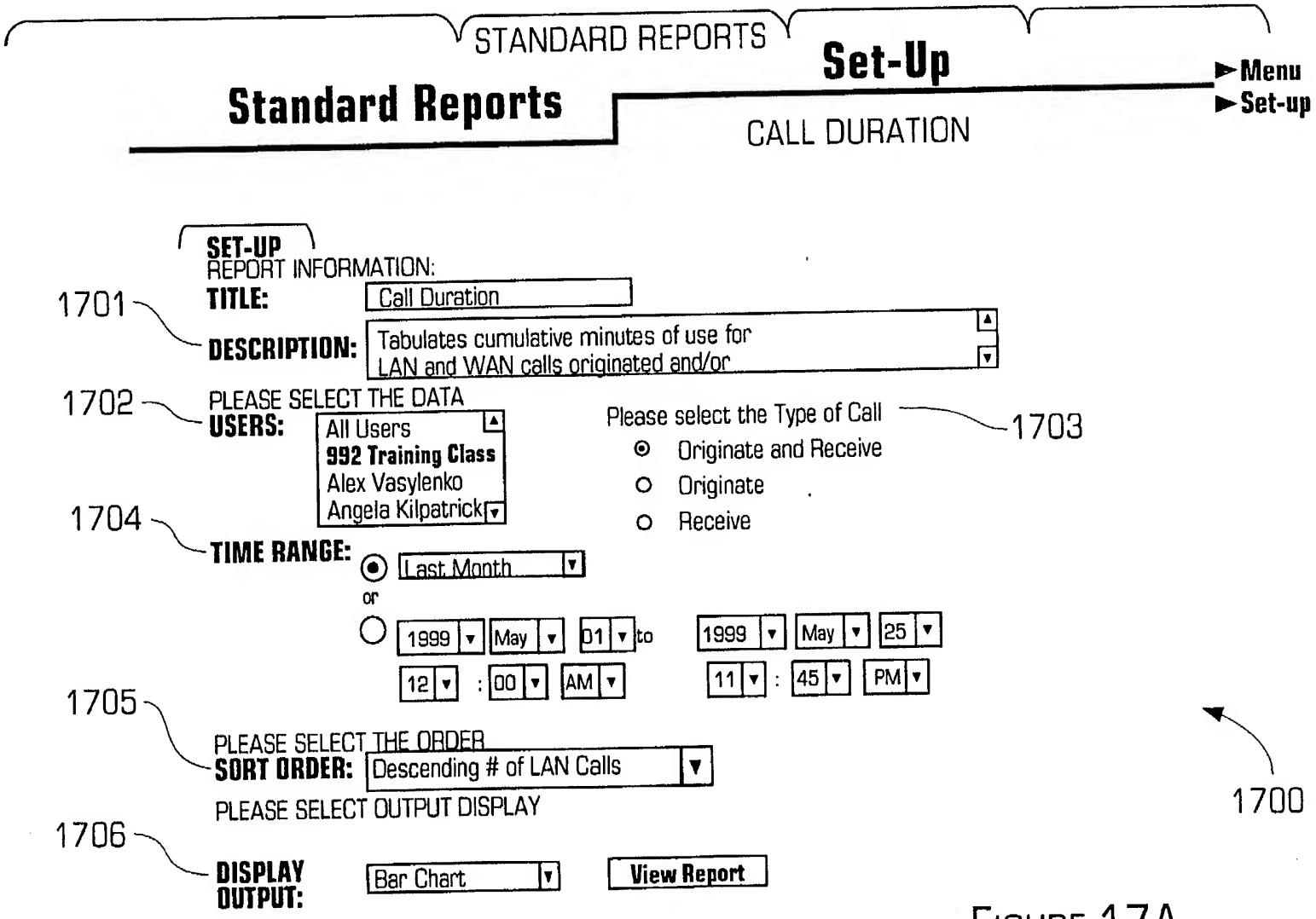


FIGURE 17A

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018447

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018441

STANDARD REPORTS

Standard Reports

View Report

CALL DURATION

PRINT FORMAT

SAVE AS CUSTOM

MODIFY

REPORT TITLE: Call Duration

REPORT DESCRIPTION: Tabulates cumulative minutes of use for LAN and WAN calls originated and/or received by specified users during a time period.

TYPE OF CALL: Originate and Receive

TIME RANGE: 04/01/1999 12:00 AM - 04/30/1999 11:59 PM

SORT ORDER: Descending # of LAN Calls

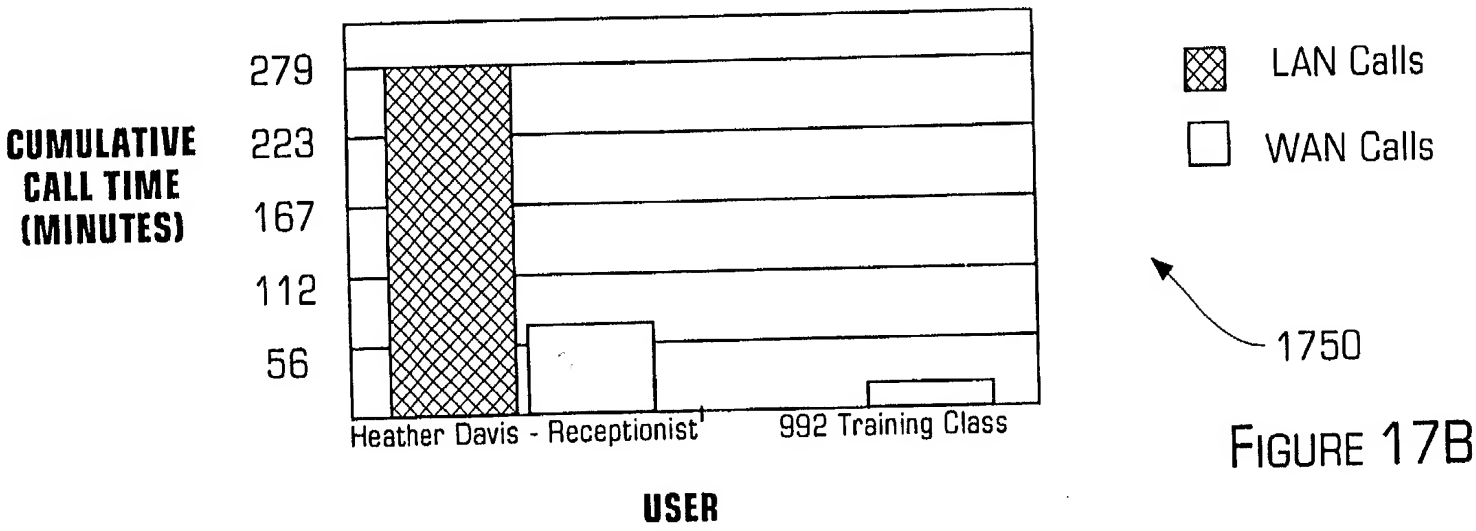


FIGURE 17B

Standard Reports

View Report

CALL DURATION

PRINT FORMAT

SAVE AS CUSTOM

MODIFY

REPORT TITLE: Call Duration

REPORT DESCRIPTION: Tabulates cumulative minutes of use for LAN and WAN calls originated and/or received by specified users during a time period.

TYPE OF CALL: Originate and Receive

TIME RANGE: 04/01/1999 12:00 AM - 04/30/1999 11:59 PM

SORT ORDER: Descending # of LAN Calls

USER	LAN CALLS	WAN CALLS
GREG PAXTON	60	94
JAN AFRIDI	117	161
ERIC WOOD	171	208
PAUL GAMBERDELLA	208	240
BRIAN WOOD	392	444
JIM HUGHES	1122	792
TOTAL	**2070**	**1939**

1750

FIGURE 17C

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018441

REPORT TITLE: Call Duration

REPORT DESCRIPTION: Tabulates cumulative minutes of use for LAN and WAN calls originated and/or received by specified users during a time period.

TYPE OF CALL: Originate

TIME RANGE: 05/01/1999 12:00 AM - 05/31/1999 11:59 PM

SORT ORDER: Descending # of LAN Calls

USER	LAN CALLS	WAN CALLS
GREG PAXTON	60	94
JAN AFRIDI	117	161
ERIC WOOD	171	208
PAUL GAMBERDELLA	208	240
BRIAN WOOD	392	444
JIM HUGHES	1122	792
TOTAL	**2070**	**1939**

1750

FIGURE 17D

Docket # 3561-0102

Standard Reports | **View Report**

USER CALL TOTAL
BY TIME PERIOD

REPORT TITLE: USER CALL TOTAL BY TIME PERIOD

REPORT DESCRIPTION: CALCULATES THE MINUTES OF USE FOR A USER (OR GROUP OF USERS) OVER A SPECIFIED PERIOD OF TIME.

TYPE OF CALL: ORIGINATE OR RECEIVE

TIME RANGE: 06/01/1999 12:00 AM - 11/30/1999 11:59 PM

SORT ORDER: TIME PERIOD

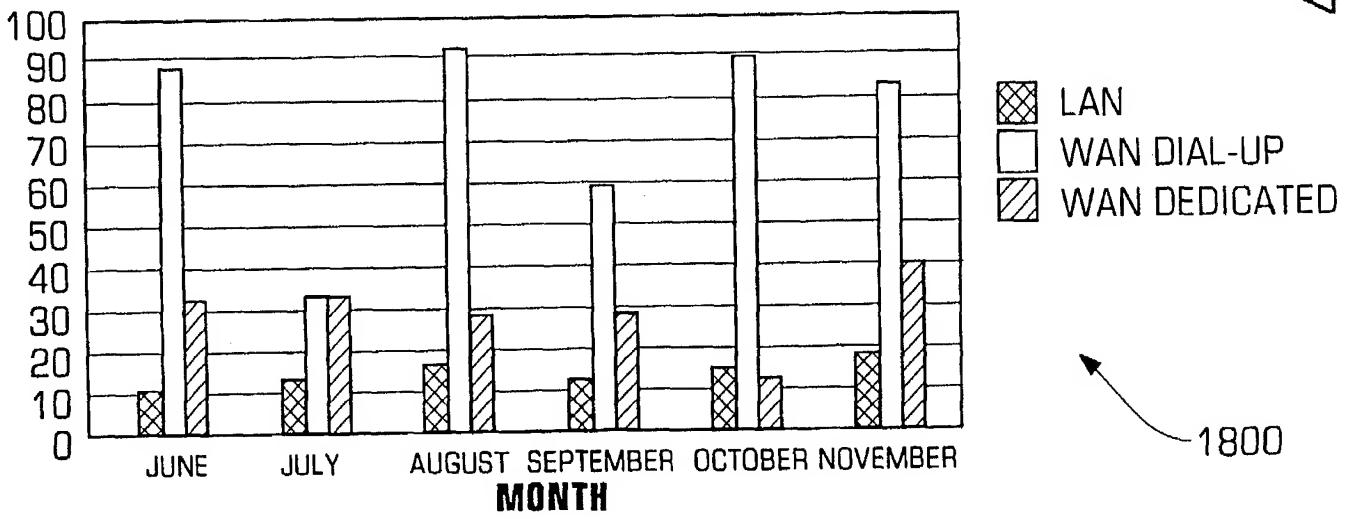


FIGURE 18A

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018441

Standard Reports

View Report

NETWORK AVAILABILITY
BY NUMBER OF CALLS

REPORT TITLE: NETWORK AVAILABILITY BY NUMBER OF CALLS

REPORT DESCRIPTION: CALCULATES THE NUMBER OF CALLS AVAILABLE FOR COMPLETION, THE NUMBER OF CALLS NOT COMPLETED DUE TO UNAVAILABLE RESOURCES, AND THE NUMBER OF CALLS NOT COMPLETED DUE TO AVISTAR NETWORK ERROR

TYPE OF CALL: N/A

TIME RANGE: 06/01/1999 12:00 AM - 11/30/1999 11:59 PM

SORT ORDER: AVISTAR NETWORK

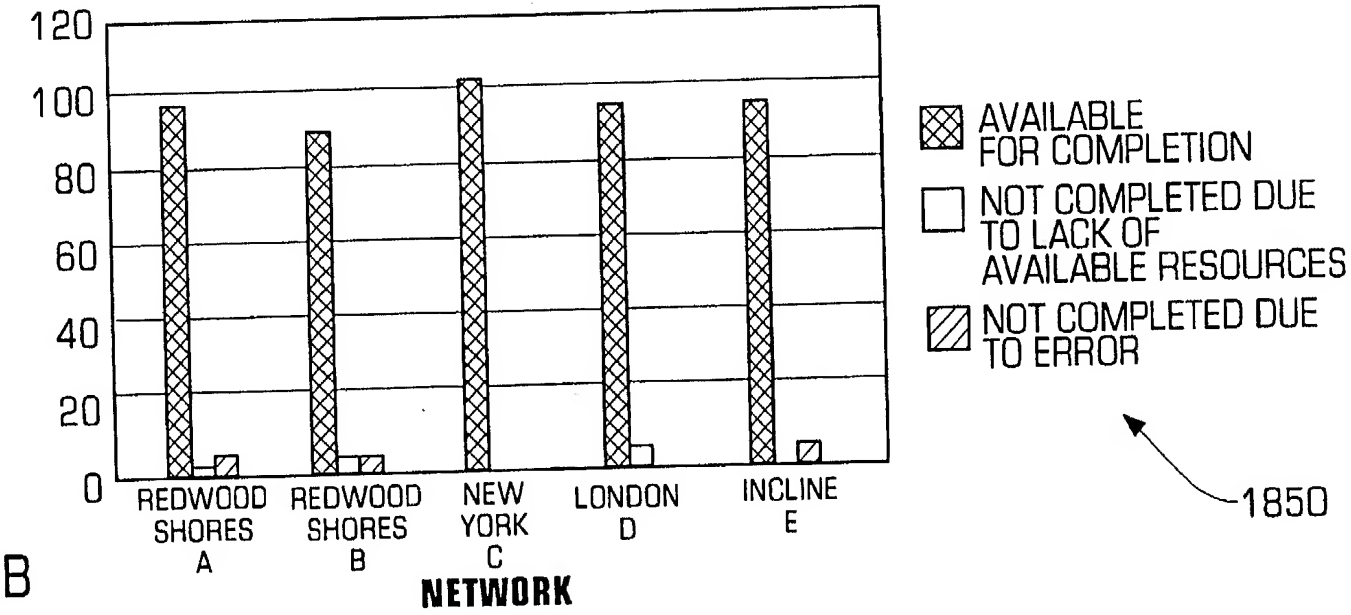


FIGURE 18B

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018441

Standard Reports

View Report

NETWORK AVAILABILITY
BY PERCENTAGE OF CALLS

REPORT TITLE: NETWORK AVAILABILITY BY PERCENTAGE OF CALLS

REPORT DESCRIPTION: CALCULATES THE PERCENTAGE OF CALLS AVAILABLE FOR COMPLETION, THE NUMBER OF CALLS NOT COMPLETED DUE TO UNAVAILABLE RESOURCES, AND THE NUMBER OF CALLS NOT COMPLETED DUE TO AVISTAR NETWORK ERROR

TYPE OF CALL: N/A

TIME RANGE: 06/01/1999 12:00 AM - 11/30/1999 11:59 PM

SORT ORDER: AVISTAR NETWORK

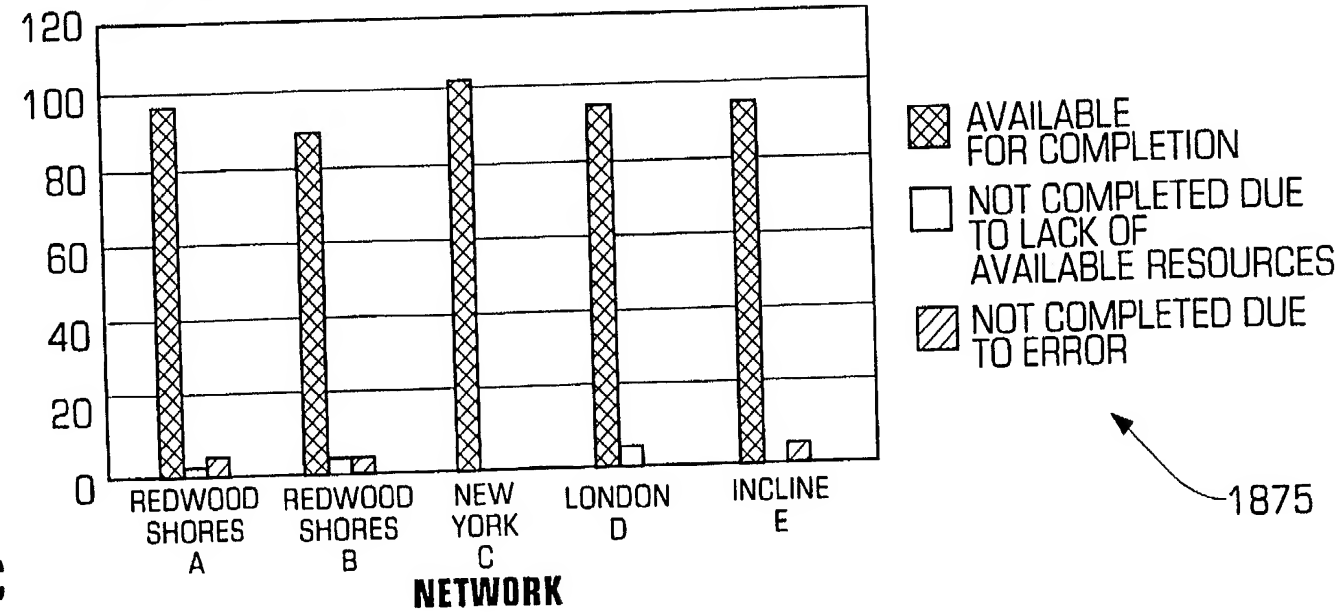


FIGURE 18C

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT, et al.
10/018441

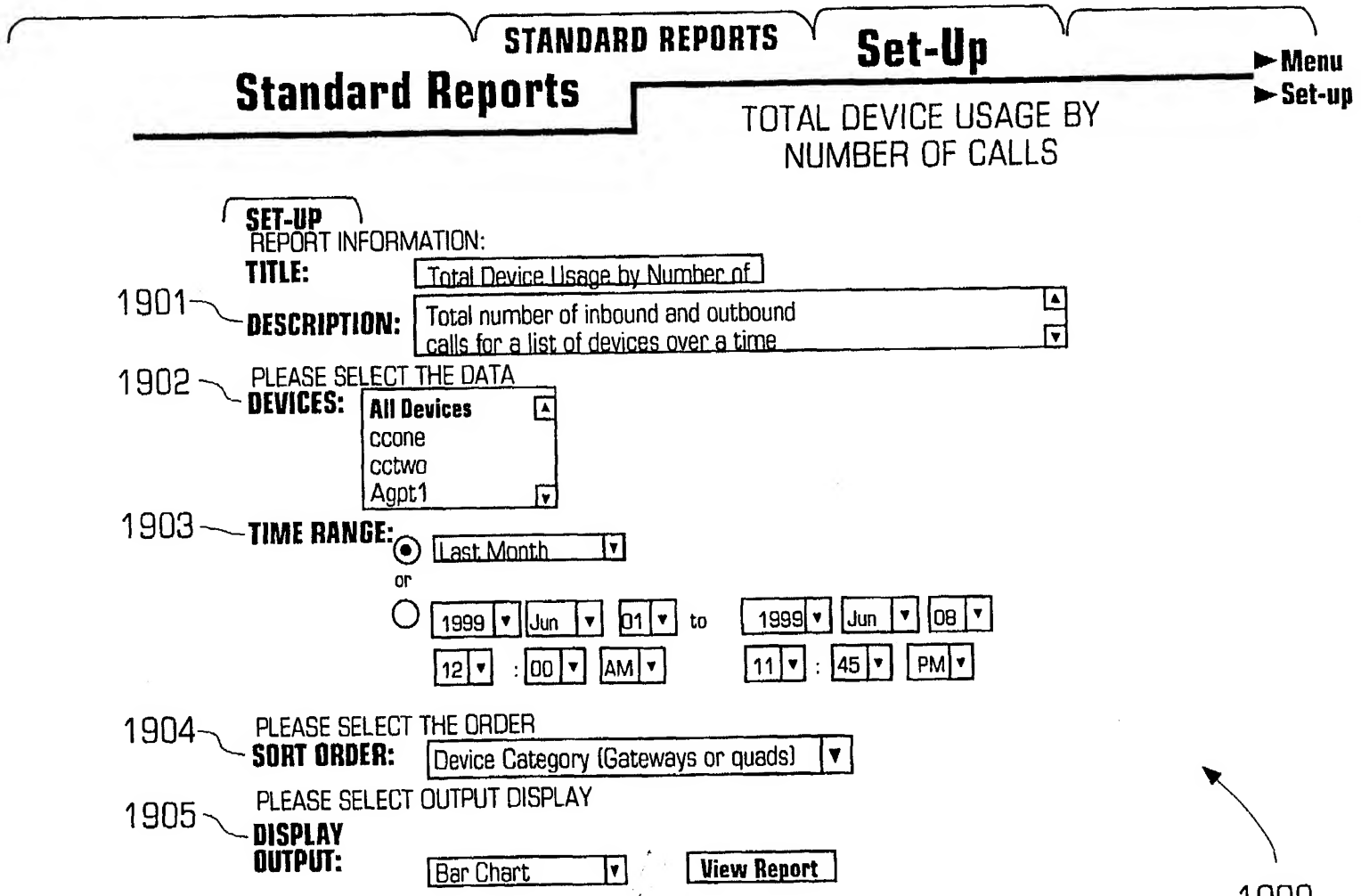


FIGURE 19A

Standard Reports

View Report

TOTAL DEVICE USAGE BY NUMBER OF CALLS

PRINT FORMAT

SAVE AS CUSTOM

MODIFY

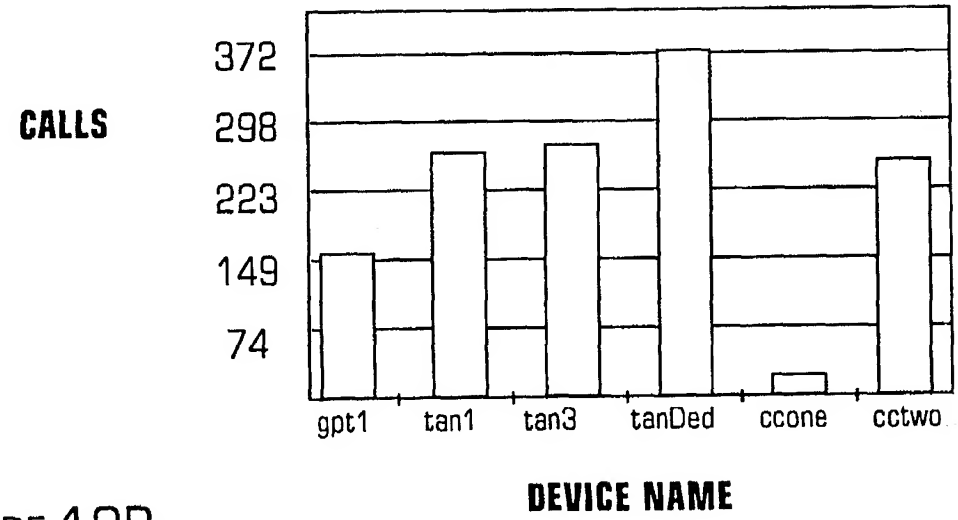
REPORT TITLE: Total Device Usage by Number of Calls

REPORT DESCRIPTION: Total number of inbound and outbound calls for a list of devices over a time range.

TYPE OF CALL: N/A

TIME RANGE: 04/01/1999 12:00 AM - 04/30/1999 11:59 PM

SORT ORDER: Device Category (Gateways or quads)



1950

FIGURE 19B

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018441

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018441

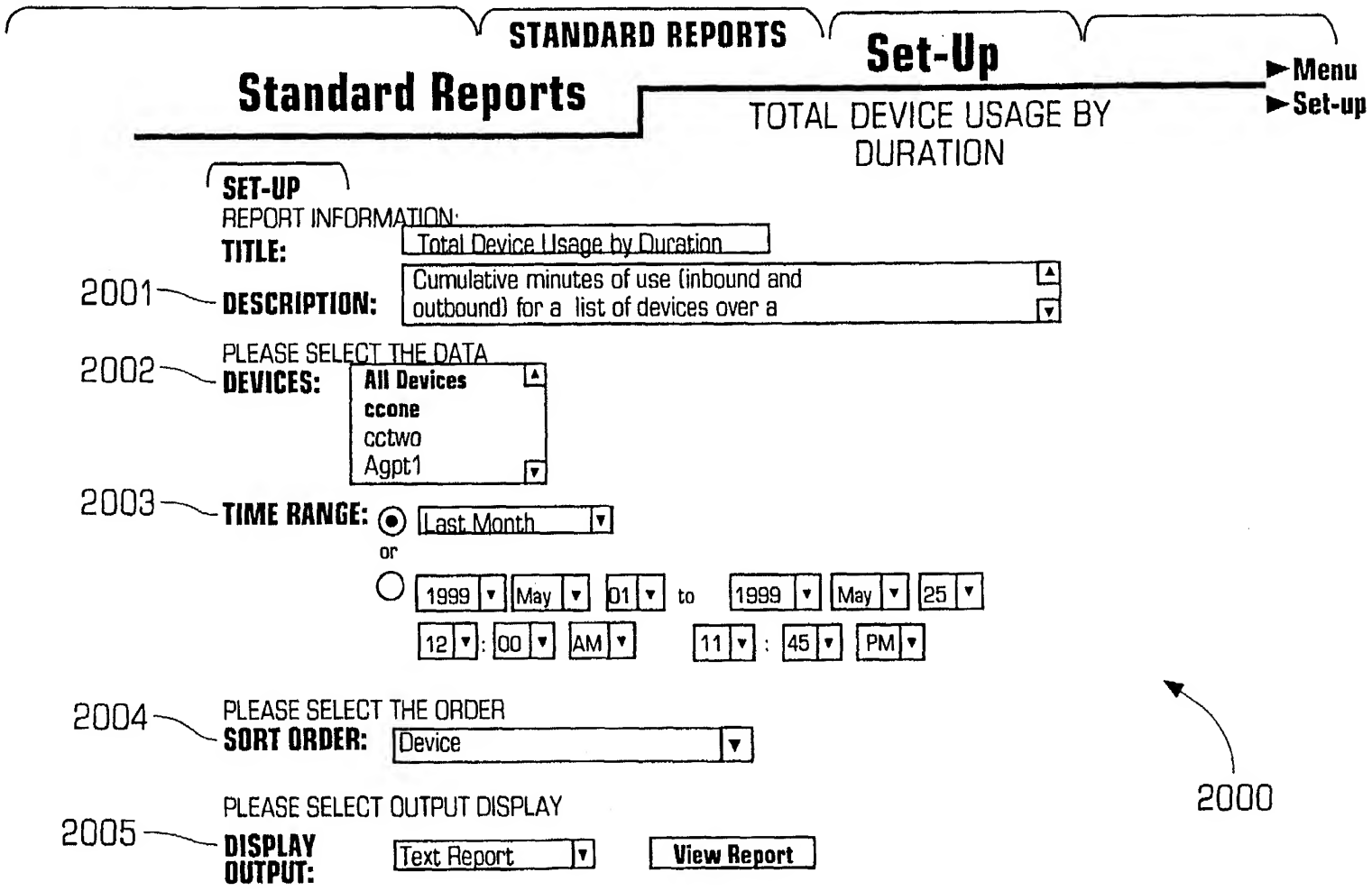


FIGURE 20A

Standard Reports

View Report

TOTAL DEVICE USAGE BY DURATION

PRINT FORMAT

SAVE AS CUSTOM

MODIFY

REPORT TITLE: Total Device Usage by Duration

REPORT DESCRIPTION: Cumulative minutes of use (inbound and outbound) for a list of devices over a time range.

TYPE OF CALL: N/A

TIME RANGE: 04/01/1999 12:00 AM - 04/30/1999 11:59 PM

SORT ORDER: Device

DEVICE NAME	MINUTES IN USE
cctwo	679
gpt1	209
tanDed	800

Page: [1]

2050

FIGURE 20B

10/018441

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018471

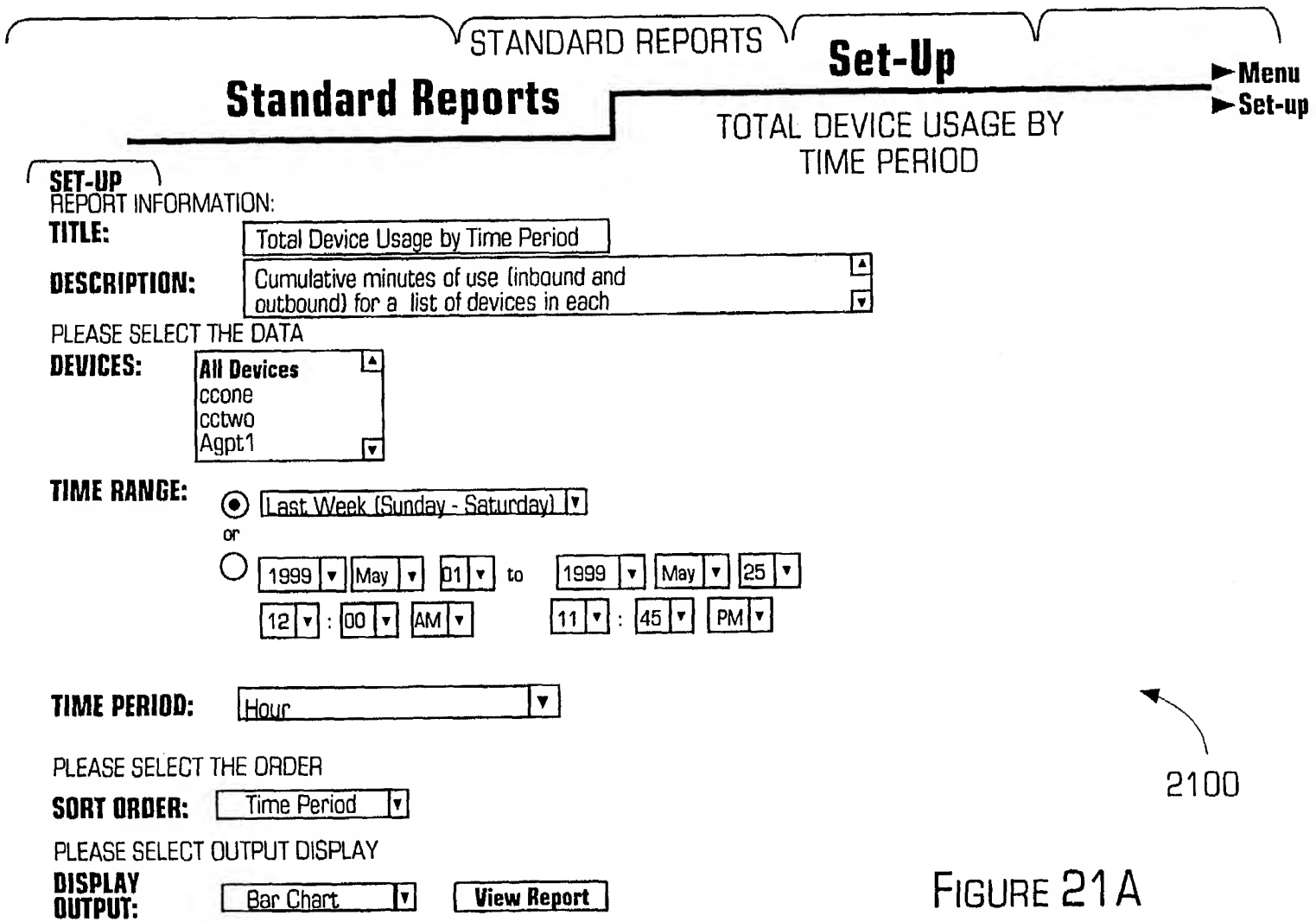


FIGURE 21A

20+050 Internet

STANDARD REPORTS

Standard Reports

View Report

TOTAL DEVICE USAGE BY TIME PERIOD

PRINT FORMAT

SAVE AS CUSTOM

MODIFY

REPORT TITLE: Total Device Usage by Time Period

REPORT DESCRIPTION: Cumulative minutes of use (inbound and outbound) for a list of devices in each time period over a range of time.

TYPE OF CALL: N/A

TIME RANGE: 01/01/1999 12:00 AM - 05/25/1999 4:37 PM

SORT ORDER: Time Period

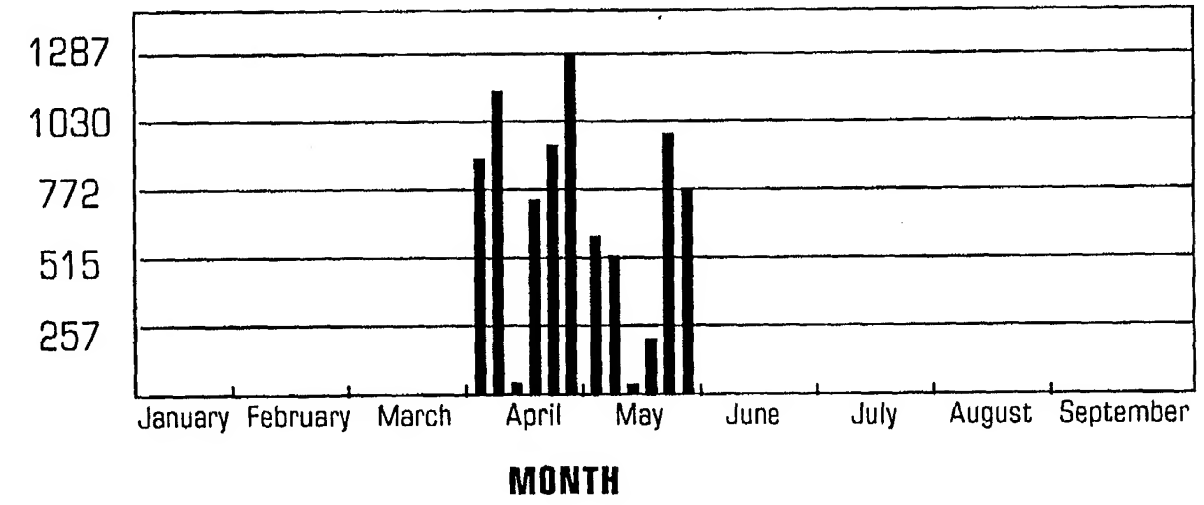


FIGURE 21B

2150

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018441

BOARD TRANSCRIPT

Standard Reports

View Report

CONFERENCE CENTER USAGE
BY NUMBER OF USES

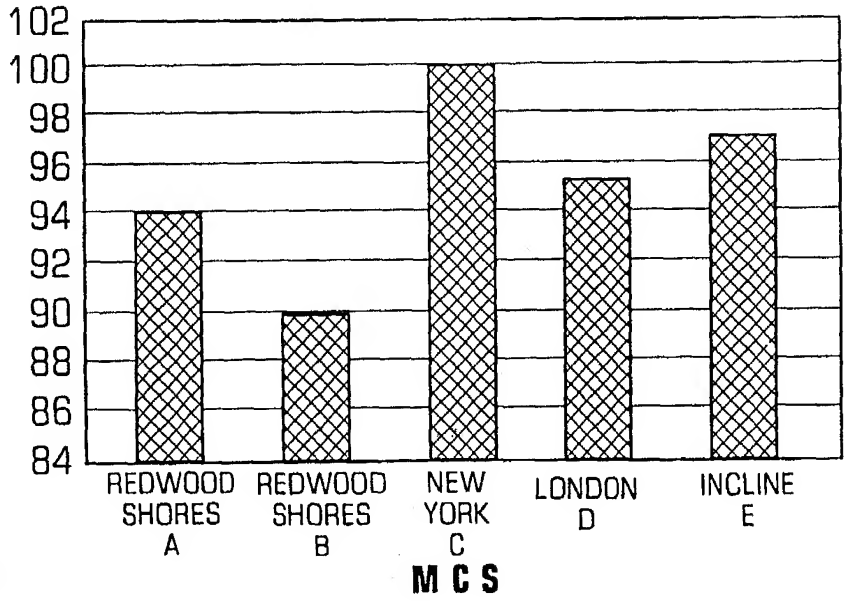
REPORT TITLE: CONFERENCE CENTER USAGE BY NUMBER OF USES

REPORT DESCRIPTION: CALCULATES THE NUMBER OF TIMES THE SPECIFIED CONFERENCE CENTER IS USED

TYPE OF CALL: N/A

TIME RANGE: 06/01/1999 12:00 AM - 11/30/1999 11:59 PM

SORT ORDER: AVISTAR NETWORK



2200

FIGURE 22A

Standard Reports

View Report

CONFERENCE CENTER USAGE
BY CUMULATIVE TIME USED

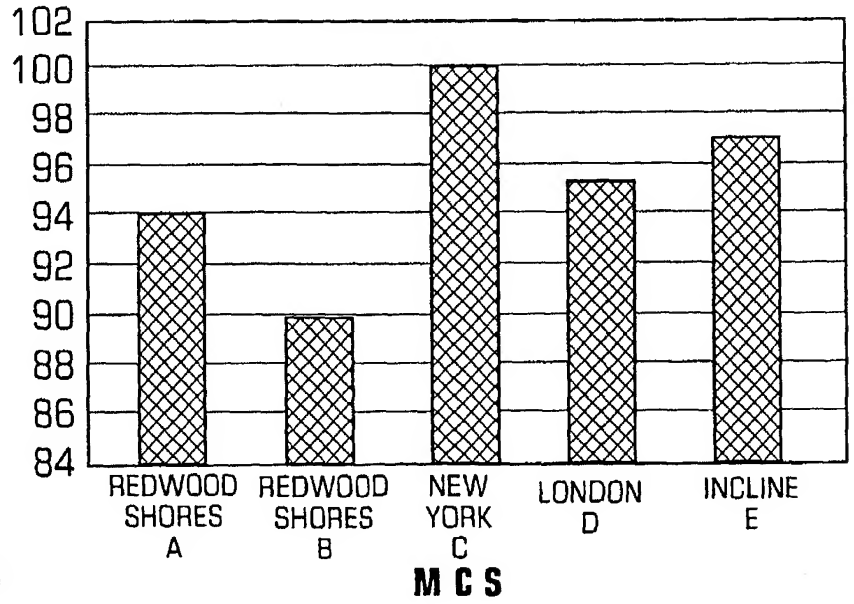
REPORT TITLE: CONFERENCE CENTER USAGE BY CUMULATIVE TIME USED

REPORT DESCRIPTION: CALCULATES THE CUMULATIVE TIME THE SPECIFIED CONFERENCE CENTER IS USED

TYPE OF CALL: N/A

TIME RANGE: 06/01/1999 12:00 AM - 11/30/1999 11:59 PM

SORT ORDER: AVISTAR NETWORK



2225

FIGURE 22B

3D+DSD Tmstbot

Standard Reports

View Report

CONFERENCE CENTER BUSY BY PERCENTAGE OF ATTEMPTED USE

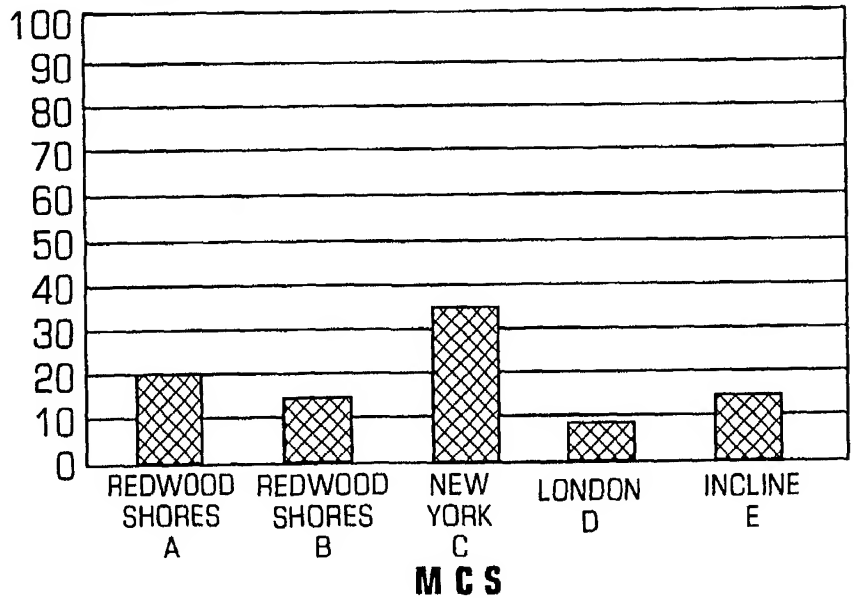
REPORT TITLE: CONFERENCE CENTER BUSY BY PERCENTAGE OF ATTEMPTED USE

REPORT DESCRIPTION: CENTER ON THE SPECIFIED AVISTAR NETWORK WAS BUSY WHEN IT WAS CALLED

TYPE OF CALL: N/A

TIME RANGE: 06/01/1999 12:00 AM - 11/30/1999 11:59 PM

SORT ORDER: AVISTAR NETWORK



2250

FIGURE 22C

PROOF OF PAPER

Standard Reports | **View Report** ★ CONFERENCE CALL AVAILABILITY

REPORT TITLE: CONFERENCE CALL AVAILABILITY

REPORT DESCRIPTION: CALCULATES THE NUMBER OF CONFERENCE CALLS AVAILABLE FOR COMPLETION, THE NUMBER OF CONFERENCE CALLS NOT COMPLETED DUE TO UNAVAILABLE RESOURCES, AND THE NUMBER OF CALLS NOT COMPLETED DUE TO AVISTAR NETWORK ERROR

TYPE OF CALL: N/A

TIME RANGE: 06/01/1999 12:00 AM - 11/30/1999 11:59 PM

SORT ORDER: AVISTAR NETWORK

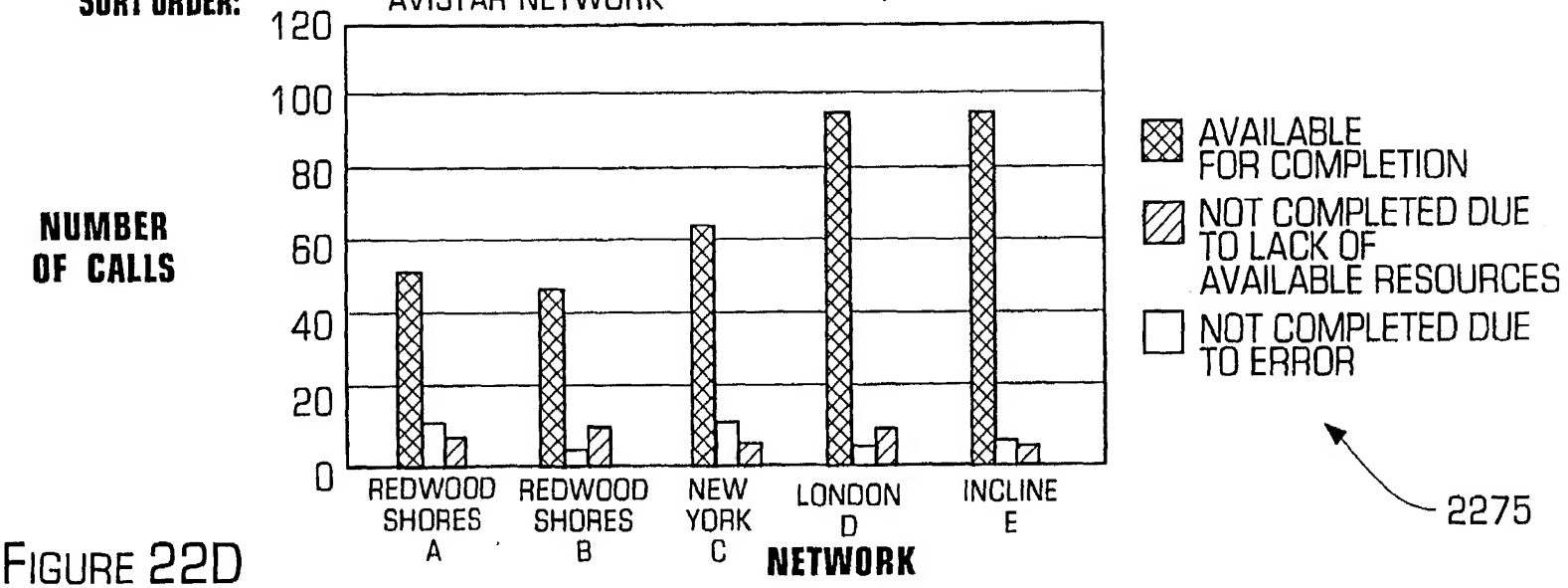


FIGURE 22D

20:020 TM:8T00T

TRUNK BUSIES REPORT

SUMMARY FOR DALLAS:texas3

AVISTAR SWITCH	5:00AM	6:00AM	7:00AM	8:00AM	9:00AM	10:00AM	11:00AM	12:00PM	1:00PM	2:00PM	3:00PM	4:00PM	5:00PM	6:00PM
REDWOOD SHORES: A	1	0	0	0	0	3	4	5	10	12	10	6	0	0
REDWOOD SHORES: A	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REDWOOD SHORES: B	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REDWOOD SHORES: B	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NEW YORK: C	0	0	0	0	0	1	2	3	1	3	4	6	2	0
LONDON: D	0	0	0	0	0	0	0	0	0	0	0	1	2	3

2290

FIGURE 22E

Title : SYSTEM AND METHOD FOR BROWSER-BASED MULTI-MEDIA COLLABORATION REPORTING
Inventor(s): Gerald BURNETT et al.
10/018441

20450-74870

TRUNK BUSIES REPORT

SUMMARY FOR ETON:walrus

AVISTAR SWITCH	5:00AM	6:00AM	7:00AM	8:00AM	9:00AM	10:00AM	11:00AM	12:00PM	1:00PM	2:00PM	3:00PM	4:00PM	5:00PM	6:00PM
REDWOOD SHORES: A	1	0	0	0	0	3	4	5	10	12	10	6	0	0
REDWOOD SHORES: A	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REDWOOD SHORES: B	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REDWOOD SHORES: B	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NEW YORK: C	0	0	0	0	0	1	2	3	1	3	4	6	2	0
LONDON: D	0	0	0	0	0	0	0	0	0	0	0	1	2	3

2290

FIGURE 22F

CUSTOM REPORTS

My Custom Reports

MENU

The Custom Reports listed below have been saved.
To create a Custom Report, start with a Standard Report or a Custom Report, modify any report settings, then click the "save as custom" button.

USER ACTIVITY

PA Sales/AD - Last Month Call Duration
Created: 06/09/1999
Tabulates cumulative minutes of use for LAN and WAN calls originated and/or received by specified users during a time period.
[delete]

mac stacked/Number of Calls Completed by User
Created: 06/03/1999
netscape 4.0 - mac - stacked report
[delete]

Number of Calls Completed by Time Period
Created: 06/03/1999
mac i.e. 4.0 stacked chart
[delete]

Number of Calls Completed by User
Created: 06/03/1999
mac i.e. 4.0 bar chart saved report - print version working also.
[delete]

User Call Detail - mac text i.e. 4.0
Created 06/03/1999
Detailed account of the calls made to (originate), from (receive), or to and from (originate and receive) a user or group of users.
[delete]

MAC - Number of Calls Completed by Time Period
Created: 05/28/1999
MAC - Tabulates number of calls originated and/or received by users in time periods over a specified time range with breakdown of LAN and WAN calls.
[delete]

mac - Number of Calls Completed by User
Created: 05/28/1999
MAC - Tabulates number of calls originated and/or received by users in a time period with breakdown of LAN and WAN calls
[delete]

Number of Calls Completed by User
Created: 05/28/1999
Tabulates number of calls originated and/or received by users in a time period with breakdown of LAN and WAN calls
[delete]

User Call Detail - saving on the mac
Created:05/28/1999
This report is generated and saved from a mac.
Detailed account of the calls made to (originate, from (receive), or to and from (originate and receive) a user or group of users.
[delete]

RESOURCE USAGE

- Mac Total Device Usage by Duration
Created: 06/03/1999
Cumulative minutes of use (inbound and outbound) for a list of devices over a time range.
[delete]

Total Device Usage by Number of Calls
Created: 06/03/1999
netscape 4.0 mac - text report
[delete]

Total Device Usage by Duration - mac testing more
Created: 05/28/1999
mac - Cumulative minutes of use (inbound and outbound) for a list of devices over a time range.
[delete]

Total Device Usage by Duration
Created: 04/16/1999
Cumulative minutes of use (inbound and outbound) for a list of devices over a time range.
[delete]

Quad Usage by Number of Calls
Created: 04/14/1999
Total number of inbound and outbound calls for a list of devices over a time range.
[delete]

2300

FIGURE 23

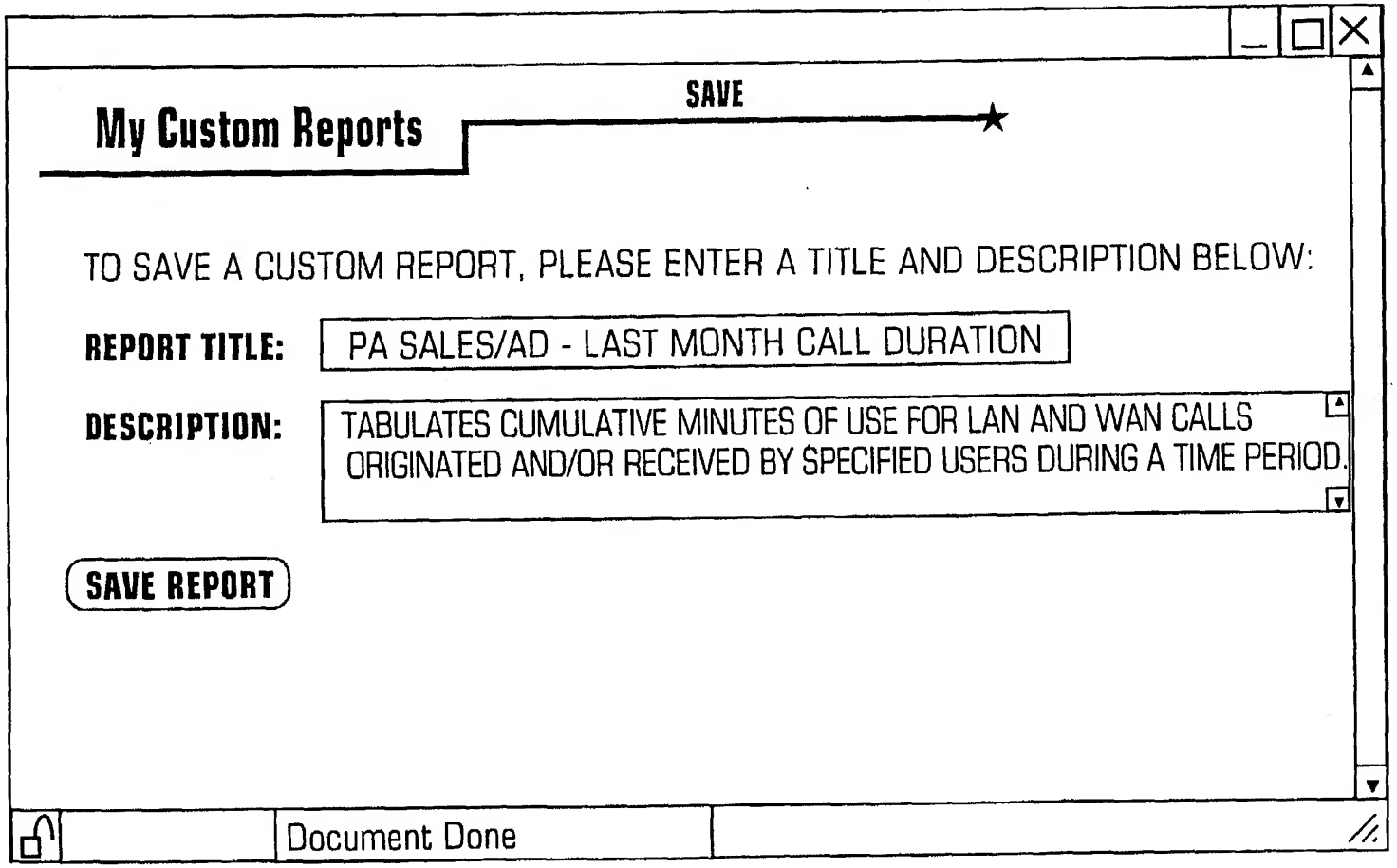

SAVE
My Custom Reports
TO SAVE A CUSTOM REPORT, PLEASE ENTER A TITLE AND DESCRIPTION BELOW:
REPORT TITLE:
PA SALES/AD - LAST MONTH CALL DURATION
DESCRIPTION:
TABULATES CUMULATIVE MINUTES OF USE FOR LAN AND WAN CALLS ORIGINATED AND/OR RECEIVED BY SPECIFIED USERS DURING A TIME PERIOD.
SAVE REPORT
Document Done
2400

FIGURE 24

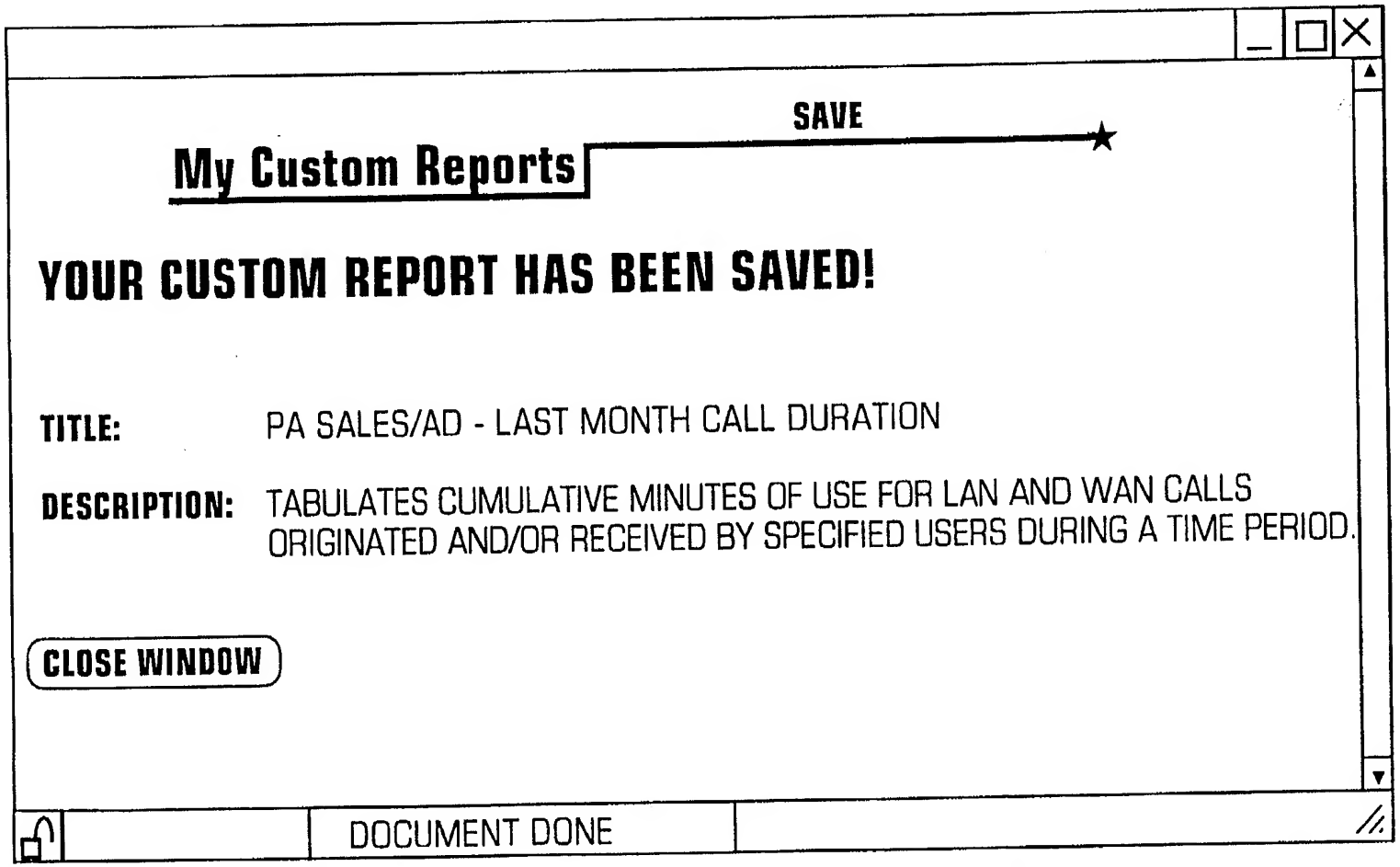

SAVE
My Custom Reports
YOUR CUSTOM REPORT HAS BEEN SAVED!
TITLE:
PA SALES/AD - LAST MONTH CALL DURATION
DESCRIPTION:
TABULATES CUMULATIVE MINUTES OF USE FOR LAN AND WAN CALLS ORIGINATED AND/OR RECEIVED BY SPECIFIED USERS DURING A TIME PERIOD.
CLOSE WINDOW
DOCUMENT DONE
2500

FIGURE 25

DECLARATION AND POWER OF ATTORNEY FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

As a below named inventor, I hereby declare that: My residence, mailing address, and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

SYSTEM AND METHOD FOR BROWSER BASED MULTIMEDIA COLLABORATION REPORTING

The application of which

☐ is attached hereto OR ☑ was filed on June 9, 2000 as United States Application Number or PCT International Application Number PCT/US00/15990 and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified application, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part application(s), material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application(s) which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application(s) having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date	Priority Claimed Yes	No

I hereby claim domestic priority benefits under 35 United States Code §120 of any United States application(s), §119(e) of any United States provisional application(s), or §365(c) of any PCT International application(s) designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in a listed prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge my duty to disclose any information material to the patentability of this application as defined in 37 C.F.R. 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Prior U.S. or International Application Number(s)	U.S. or International Filing Date	Status
60/138,921	6/11/1999	

I hereby appoint all attorneys of **SUGHRUE MION, PLLC** who are listed under the USPTO Customer Number shown below as my attorneys to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith, recognizing that the specific attorneys listed under that Customer Number may be changed from time to time at the sole discretion of Sughrue Mion, PLLC, and request that all correspondence about the application be addressed to the address filed under the same USPTO Customer Number.

23493

PATENT TRADEMARK OFFICE

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR:

1-cc

Given Name (first and middle [if any]): Gerald

Family Name or Surname: BURNETT

Inventor's Signature: G J Burnett

Date: 1/8/02

Residence: City: Atherton CA | State: California | Country: US | Citizenship: US

Mailing Address: 207 Atherton Avenue

City: Atherton | State: California | Zip: 94027 | Country: US

NAME OF SECOND INVENTOR:

2-cc

Given Name (first and middle [if any]): Jozef C.

Family Name or Surname: LAUWERS

Inventor's ~~Signature~~:

Date: 1/7/2002

Residence: City: Los Altos CA | State: California | Country: US | Citizenship: US

Mailing Address: 1225 Brentwood Street

City: Los Altos | State: California | Zip: 94024 | Country: US

NAME OF THIRD INVENTOR:

3-cc

Given Name (first and middle [if any]): Lauren

Family Name or Surname: CALABY

Inventor's Signature: Lauren F Calaby

Date: 12/17/01

Residence: City: Bellevue WA | State: Washington | Country: US | Citizenship: US

Mailing Address: 14918 SE 64th

City: Bellevue | State: Washington | Zip: 98006 | Country: US

NAME OF FOURTH INVENTOR:

4-cc

Given Name (first and middle [if any]): James Philip

Family Name or Surname: HUGHES

Inventor's Signature: James P Hughes

Date: 1/11/02

Residence: City: Hillsborough CA | State: California | Country: US | Citizenship: US

Mailing Address: 520 Darrell Road

City: Hillsborough | State: California | Zip: 94010 | Country: US

NAME OF FIFTH INVENTOR:

5-cc

Given Name (first and middle [if any]): Yul

Family Name or Surname: INN

Inventor's Signature:

Date: 1-4-02

Residence: City: Cupertino CA | State: California | Country: US | Citizenship: US

Mailing Address: 22281 Bellevue Avenue

City: Cupertino | State: California | Zip: 95014 | Country: US

(9) over

NAME OF SIXTH INVENTOR:			
Given Name (first and middle [if any]) Richard		Family Name or Surname VANDERLIPPE	
Inventor's Signature Richard Vanderlippe		Date 01-09-02	
Residence: City Belmont CA	State California	Country US	Citizenship US
Mailing Address: 1922 Lyon Avenue			
City Belmont	State California	Zip 94002	Country US

NAME OF SEVENTH INVENTOR:			
Given Name (first and middle [if any]) Eric		Family Name or Surname HORSCHMAN	
Inventor's Signature Eric J Horschman		Date	
Residence: City San Ramon CA	State California	Country US	Citizenship US
Mailing Address: 312 Cardona Circle			
City San Ramon	State California	Zip 94583	Country US

NAME OF EIGHTH INVENTOR:			
Given Name (first and middle [if any]) Brian		Family Name or Surname WALLIN	
Inventor's Signature B-Wallin		Date	
Residence: City San Clemente CA	State California	Country US	Citizenship US
Mailing Address: 2913 Calle Heraldo			
City San Clemente	State California	Zip 92673	Country US

NAME OF NINTH INVENTOR:			
Given Name (first and middle [if any]) Lester		Family Name or Surname LUDWIG	
Inventor's Signature		Date 01/09/02	
Residence: City Belmont CA	State California	Country US	Citizenship US
Mailing Address: 555 Twin Dolphin Drive, #360			
City Redwood Shores	State California	Zip 94065	Country US